
INTERNATIONAL RESEARCH PROJECT (IRP)

FORMULAIRE DE DEPOT / *TEMPLATE FOR APPLICATION*

10 pages maximum

1) PRESENTATION / *PRESENTATION*

a) Nom et acronyme du projet

Name and acronym of the project

**Ancestral causes of OBesity: understanding EPIgenetic transmission by SPERMatozoa
OBEPI-SPERM**

b) Nom, laboratoire, organisme d'appartenance et adresses (postale et courriel) du coordinateur français et du coordinateur étranger

Names of the French and foreign coordinators, their laboratories, departments and institutions with addresses (postal and e-mail).

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2) RESUME EN FRANÇAIS ET EN ANGLAIS / ABSTRACT IN FRENCH AND IN ENGLISH

L'objectif de ce projet de recherche international (IRP) est de faciliter les liens entre le CBMR – Université de Copenhague au Danemark et l'IPMC – CNRS, Sophia Antipolis, en répondant aux questions fondamentales des effets à long terme de notre environnement sur le déterminisme génétique de notre descendance. Les récents développements en épigénétique nous permettent aujourd'hui d'étudier, de façon expérimentale, les questions fascinantes de la mémoire cellulaire des facteurs nutritionnels et de l'exercice physique sur le métabolisme et sur le développement de notre système nerveux central. Nos observations antérieures ont permis d'identifier que le régime alimentaire et l'activité physique entraînent des remodelages épigénétiques dans les spermatozoïdes à proximité de gènes contrôlant le développement du système nerveux central. Nos données préliminaires indiquent qu'un lien existe entre la nutrition paternelle avant la conception et le comportement de la descendance, ce qui suggère que les remodelages épigénétiques des spermatozoïdes en réponse au régime constituent un mécanisme par lequel l'environnement avant la conception conditionne le développement du système nerveux central et le comportement de la descendance. Cet IRP a pour ambition de consolider les liens entre le consortium GECKO (Gametic Epigenetics Consortium against Obesity) établi au Danemark et l'IPMC-CNRS, un institut possédant une forte expertise en neurobiologie. En facilitant les échanges de chercheurs aux expertises diverses (épigénétique, biologie de la reproduction, nutrition et neurobiologie), l'IRP permettra d'accélérer la recherche menée dans le contexte de GECKO et d'approfondir les liens collaboratifs entre la France et le Danemark.

The objective of this international research project (IRP) is to foster a productive collaboration between the CBMR – University of Copenhagen in Denmark and the IPMC – CNRS at Sophia Antipolis, and to answer the enduring question related to the long-term effects of environmental factors on the heritability of disease in the next generation offspring. The recent developments in epigenetics allow us to experimentally address the fascinating question of the long-term memory of nutritional factors and physical exercise on metabolism and on the development of our central nervous system. Our previous observations identified that diet and physical activity drive epigenetic remodelling near genes controlling the development of the central nervous system. Our preliminary data indicate that a link exists between preconception paternal nutrition and offspring behaviour, suggesting that epigenetic remodelling in sperm in response to diet constitutes a mechanism by which the preconceptional environment influences the development of the central nervous system and the behaviour of offspring. This IRP aims to consolidate the links between the GECKO consortium (Gametic Epigenetics Consortium against Obesity) established in Denmark and the IPMC-CNRS, an institute with strong expertise in neurobiology. By facilitating the exchange of researchers with various expertise (epigenetics, reproductive biology, nutrition and neurobiology), this international research project will accelerate the research carried out in the context of GECKO and deepen the collaborative links between France and Denmark.

3) CONTEXTE ET HISTORIQUE DE LA COLLABORATION / *HISTORICAL CONTEXT OF THE COLLABORATION*

A collaboration was initiated in 2019 between Prof. Romain Barrès and Dr. Jean-Louis Nahon, the Director of the IPMC. In 2020, a formal collaborative agreement with a budget of 96k€ was made between the GECKO consortium and Dr. Nahon to explore the factors involved in the regulation of appetite. In 2021, Prof. Barrès was recruited as a Director of Research (DR2) at the CNRS to establish research activities at the IPMC. In the fall 2021, a delegation from the CNRS including Dr. Emmanuel Brouillet and Dr. Christian Muchardt visited the CBMR in Copenhagen, where a common interest to establish a formal collaboration between the CBMR and the IPMC was identified. In particular, an opportunity was identified to facilitate a cross fertilizing collaboration between the CBMR and the CNRS in the context of the GECKO, a consortium funded by the Novo Nordisk Foundation with over 8 M€ budget in the period 2019-2025. Since then, five short term visits to Copenhagen from Prof. Barrès, who retains a 20% affiliation with the University of Copenhagen have taken place, and an agreement from the Novo Nordisk Foundation to relocate some funds (250k€ per year) at the IPMC was obtained. In April 2022, a retreat of the GECKO has taken place in Copenhagen, where seven staff from the IPMC including Dr. Carole Rovère who is associated with this IRP.

4) DESCRIPTION DU PROJET SCIENTIFIQUE / *DESCRIPTION OF THE SCIENTIFIC PROJECT*

State of the art

Our understanding of the mechanisms of heritability has undergone a paradigm shift. Prof. Barrès and his team have contributed extensively to the landmark discovery that pre-fertilization feeding factors modulate the offspring phenotype (de Castro Barbosa et al., 2019; de Castro Barbosa et al., 2016; Donkin and Barres, 2018 Ng et al., 2010). These observations indicate that the preconceptional lifestyle influences metabolism and offspring health. The team was the first to identify that sperm epigenetic signals are sensitive to environmental factors like weight loss and exercise (Donkin et al., 2016; Ingerslev et al., 2018). In human

sperm, we have identified areas of epigenetic variability near genes controlling central nervous system development (Donkin et al., 2016; Ingerslev et al., 2018). We name these regions Gametic Hotspots of Epigenetic Variation (GHEV) and postulate that these regions have the capacity to be remodeled in response to environmental stresses. We hypothesize that in response to environmental factors, epigenetic variation on GHEVs contributes to the predisposition to develop metabolic and central nervous system disorders such as obesity and autism.

Objectives

This research aims to study the mechanisms by which environmental factors before conception modulate the phenotype of offspring. We will use a nutritional geometry approach (Aim Ia) to identify the macronutrient composition of the paternal diet that is critical in inducing epigenetic heritability. Using a comparative strategy (Aim Ib), we will attempt to identify, if it exists, the common denominator of epigenetic heritability that may be conserved between animal species. We will combine our chromatin conformation data and epigenomic analyzes to (Aim Ic) identify the effect of nutritional stress on chromatin conformation and enhancer activity in offspring tissues. We will use state-of-the-art biotechnological tools to modify the epigenome in a targeted way and (Id) determine the role of GHEV methylation on cell differentiation and function. This line of research will allow a detailed understanding of the mechanisms controlling epigenetic inheritance and will open the way to new nutritional strategies before conception. It benefits from the partnerships established in the context of the GECKO consortium (Gametic Epigenetics Consortium against Obesity) that Prof. Barrès leads. This consortium, organized in partnership with the University of Chicago, the University of Sydney, the University of Copenhagen and recently the CNRS – IPMC, employs around twenty staff and integrates a bioinformatics platform made up of 6 full-time bioinformatics researchers. It has a comfortable budget of 8 million euros allocated over the period 2019-2025.

Aim Ia – To identify the paternal diet that is critical to epigenetic inheritance

We hypothesize that certain epigenetic signals contained in the gametes of males subjected to nutritional stress are mediators of the preconception influence on the phenotype of the offspring. Using the Nutritional Geometry Framework, NGF, progress in nutritional biology developed by Prof. Simpson from the University of Sydney and partner of GECKO (Raubenheimer and Simpson, 2016; Simpson et al., 2015), we will determine the macronutrient composition of the diet capable of inducing epigenetic inheritance. The NGF approach differs from traditional approaches in nutritional science because it studies the whole diet rather than its separate components (Raubenheimer and Simpson, 2016; Simpson et al., 2015). This approach will allow us to map the effects of ingesting particular combinations of nutrients in the form of response topologies, providing a visual readout of how nutrient intakes in the sire influence offspring, e.g. behavior, metabolism, disease prevalence, reproductive capacity and mortality.

We will establish NGF in the C57Bl6 mouse and titrate dietary macronutrient ratios and compare the behavior and energy metabolism of F1 (Figure 1). Males will receive 10 diets of varying macronutrient compositions (proteins, carbohydrates and lipids) and will then be mated with mothers receiving a standard diet. F1 mice will be tested for their ability to metabolize glucose and for their anxiety levels, using neuroscience methods in which my host institute has undeniable expertise. These functional characterizations will be carried out in close partnership with Pr. Simpson's team, thus benefiting from its expertise and the infrastructure of the Charles Perkin Center at the University of Sydney in terms of animal experimentation. The team in Copenhagen will analyze the epigenomic profiles of mouse spermatozoa subjected to the different diets using our developed genomic methods. We will characterize DNA methylation by Reduced Representation Bisulfite Sequencing (RRBS), the expression of non-coding RNAs by small RNA-Seq and the degree of accessibility of the genome by ATAC-Seq. The integration of these analyzes will make it possible to study the link between the phenotypes of F1 and the epigenetic signatures of the spermatozoa of the fathers and thus, will allow to establish the bases of future investigations such as the microinjection of small RNAs into fertilized oocytes aimed at test causal relationships when technically

possible. We will dissect with particular attention the genomic regions with high methylation frequency in order to map the GHEVs of mice sensitive to nutritional influence.

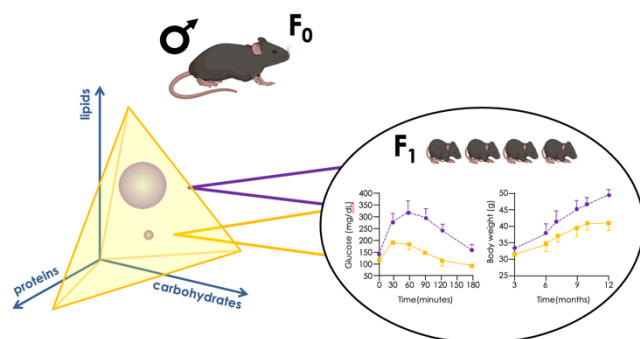


Figure 1: Identification of the diet composition that is critical to the intergenerational response by NGF. The effects of the different diets of the fathers are measured (here metabolic response) and the spectrum of the intensity of the phenotypes is reported in the figure as a topology of the responses.

Aim Ib – To explore the evolutionary dimensions of epigenetic variability

In parallel to these studies in mice, we will study the responses to nutritional stress in different species of vertebrates covering different taxa and nutritional ecologies, in order to gain mechanistic and evolutionary understanding of the essential mediators of epigenetic inheritance. We will test the hypothesis that GHEVs are concentrated near genes that regulate brain development when the species has an important cognitive and social character. This aim will particularly benefit from the partnership with the team at the IPMC and Dr. Jean-Louis Nahon / Dr. Rovère and the company BIONEIA, which is specialized in animal experimentation and is located on the Sophia Antipolis campus. To date we have undertaken studies in the mini-pig and in rabbits which were fed an obesogenic diet. In these animals, as well as in other species (humans, reptiles, birds, marsupials) subjected to similar diets, we will collect spermatozoa to establish the exhaustive epigenetic signature of the response to nutritional stress. We are aware of the complexity of bioinformatics analyzes associated with comparing sequences of dissimilar genomes. To partially overcome this difficulty, a comparison between species will be carried out by the analysis of regions differentially methylated or coding for RNA molecules with sequence similarities, using motif-based sequence analysis and genetic ontology which favors the assignment of a gene to a specific function when the gene is conserved.

Aim Ic – To study the link between DNA methylome in sperm and DNA conformation in the F1

Since DNA methylation and histone modifications are closely related, we hypothesize that DNA methylation changes in sperm cells affect gene expression in progeny somatic cells by modifying the structure of chromatin and the activity of enhancers. Enhancers target the recruitment of the transcription machinery to promoters and are characterized by the presence of post-translational modifications on histones. Using the animals described in the *Aim Ia* paragraph, we will study the link between DNA methylation in the spermatozoa of the father and the enhancer-promoter interactome of different somatic tissues such as adipose tissue, liver and hypothalamus in the F1. Similar to the strategy described in Aim Ib, we will carry out integrated analyzes of transcriptomes, ChIP-Seq, HiC promoter captures, in collaboration with our collaborator Pr. Nobrega at the University of Chicago, partner of GECKO. Specifically, we will test whether enhancer regions near or overlapping sperm GHEV regions are differentially activated and whether they target other promoters than in control mouse tissues. This approach will identify the functional role of gamete epigenetic information on the regulation of gene expression in offspring.

Aim Id – To establish the effects of epigenetic variation on cell function

Until now, studies in the field of epigenetics have almost exclusively focused on describing associations between epigenetic marks and phenotype and have barely tested causal relationships. Thanks to a very

recently developed method using CRISPR technology (Vojta et al., 2016), we propose to determine the effect of epigenetic variation of GHEVs on cellular differentiation and function, and to answer the enduring question of the mutagenic nature of methylated cytosines in our genome. We will use mouse embryonic stem cells transduced with a lentivirus containing (1) the coding sequence of a nuclease inactivated CRISPR-Cas9 chimeric protein fused to DNA methyltransferase 3A and (2) several guide RNAs targeting regions GHEV in multiplex. Embryonic stem cells will be differentiated into different lineages (e.g., adipocyte, muscle and neuronal) and the effect of GHEV methylation on cell differentiation and function will be analyzed. This part of the project constitutes an unprecedented approach, capable of informing the causal role of methylation in specific genomic regions on lineage commitment and cell differentiation. At the level of a population of individuals, epigenetic variation could represent a mechanism allowing genetic variation (Feinberg and Irizarry, 2010). During our investigations in humans with obesity, we observed an overlap between differentially methylated regions and genetic variants identified by GWAS, suggesting an evolutionary mechanism by which environment-induced epigenetic variation could, after mutagenesis of the methylated cytosines of the genome, lead to genetic variability transmitted in a Mendelian manner. Our model offers a unique opportunity to test whether epigenetic variation accelerates levels of genetic mutation: established stem cells possessing hypermethylated GHEV regions will be cultured over many cell generations and mutation rates on GHEVs will be measured by classical DNA sequencing.

Perspective and impact

A detailed understanding of the mechanisms controlling epigenetic inheritance in obesity will pave the way towards preclinical strategies to prevent obesity. At completion of the Programme, the team will have identified the essential preconceptional diet components that influence the sperm epigenome and which may influence the risk to develop obesity in the next human generations. This new knowledge will be a foundation for defining safe preconceptional dietary recommendation, which carries important societal implications. By providing insight into the effect of DNA methylation on de novo DNA mutations, this research will also address fundamental questions beyond the field of obesity research, such as the plasticity of vertebrate genomes, which has potential to revolutionize current dogmas about species adaptation and evolution.

5) DESCRIPTION DE L'INTERET ET DE LA VALEUR AJOUTEE DE LA COLLABORATION INTERNATIONALE POUR ATTEINDRE LES OBJECTIFS DU PROJET / *DESCRIBE THE ADDED VALUE OF THE INTERNATIONAL COOPERATION TO FULFILL THE AIMS OF THE PROJECT*

This IRP will consolidate bridges between institutions in France and Denmark and researchers with interdisciplinary expertise, an essential need for the conduction of GECKO research. The expertise in neurobiology of the IPMC in Sophia Antipolis is essential to propel GECKO and test the hypothesis that ancestral nutrition alters the behaviour phenotype of the offspring. By providing funds for travel and short-term visits between scientists in France and in Denmark, the IRP will consolidate collaboration of the consortium. The exploration of the mechanisms by which our diet influences the development of the central nervous system could not be made without the contribution of scientist with various expertise in epigenetics, bioinformatics, nutrition and neurosciences. Clearly, the outstanding expertise of the IPMC (the French team) in neurobiology constitutes a tremendous benefit for the GECKO and the project, as our preliminary results have identified that genes controlling the development of the central nervous system are particularly prone to epigenetic variation in sperm. Our observation that the behaviour of the offspring is influenced by paternal nutrition before conception strongly supports the need for conducting further animal experiments at BIONEIA (see project description) in Sophia Antipolis and the IPMC in France. The contribution of the bioinformatic platform at CBMR and the expertise in epigenetics and genomics will allow to synergistically move the research of the GECKO consortium forward.

6) DESCRIPTION DES ACTIVITÉS PRÉVUES DANS LE CADRE DU PROJET ET PLANNING / *DESCRIPTION OF THE ACTIVITIES IN THE FRAMEWORK OF THE PROJECT AND PROVIDE A TIMETABLE*

Funds of the IRP will be allocated to cover travel costs and short-term visits of French scientists to Denmark. Monthly visits will occur to ensure a productive communication process, exchange of protocols, discussion on results and planning on new directions. Visits from scientists from Denmark and other countries will be covered by the GECKO budget. By stimulating short-term visits between France and Denmark, we anticipate a cross-fertilization at the frontier of nutrition, epigenetics and neurobiology between the CNRS and the University of Copenhagen.

7) PARTICIPATION D'ÉTUDIANT(E)S ET/OU JEUNES CHERCHEUR(SE)S AUX ACTIVITÉS DU PROJET / *INVOLVEMENT OF STUDENTS AND/OR YOUNG RESEARCHERS IN THE PROJECT*

Our goal is to facilitate exchange of scientists across the board and thus, students and early career researcher will be included in these exchanges between France and Denmark. Already several exchanges have taken place notably during the GECKO retreat in Copenhagen in April 2022, where seven staff from the IPMC including 5 staff at the Master, PhD and postdoc level visited the University of Copenhagen. Our plan is to continue to stimulate exchange of young scientist throughout this IRP.

8) QUALITE SCIENTIFIQUE DES EQUIPES / *SCIENTIFIC QUALITY OF THE TEAMS*

See annexes

9) BUDGET PREVISIONNEL ANNUEL ET SOURCES DE FINANCEMENT / *PLANNED ANNUAL BUDGET AND FUNDING SOURCES*

Travel and accommodation costs

We request funding for 10 visits to Copenhagen including airfares, accommodation and food for 5 days.

Travel to and from Nice Airport/parking	100€
Airfare Nice – Copenhagen return	500€
Accommodation, 5 days @120€/day	600€
Food expenses @50€/day	250€
Ground transportation in Copenhagen	25€
Total	1475€

A budget a 15,000€ per year will allow one visit per month excluding July and August. These visits will be done by the Coordinator or the team members in France.

10) ETHIQUE / *ETHICS*

All experiments planned in the proposal were or will be subjected to local animal and human ethical committees.

ANNEXES

10 selected publications - Prof. Romain Barrès

1. Williams K, Carrasquilla GD, Ingerslev LR, Hochreuter MY, Pillon NJ, Donkin I, Versteyhe S, Zierath JR, Kilpeläinen TO, and Barrès R. Epigenetic rewiring of skeletal muscle enhancers after exercise training supports a role in whole-body function and human health. **Molecular Metabolism**. 2021 Jul 10;53:101290. [IF2020 7.422].
2. Sato S, Dyar KA, Treebak JT, Jepsen SL, Ehrlich AM, Ashcroft SP, Trost K, Kunzke T, Prade VM, Small L, Basse AS, Schöнке M, S Chen, Samad M, Baldi P, Barrès R, Walch A, Moritz T, Holst JJ, Lutter D, Zierath JR, Sassone-Corsi P. Atlas of Exercise Metabolism Reveals Time-Dependent Signatures of Metabolic Homeostasis. **Cell Metabolism**. 2022 Feb 1; 34(2):329-345 [IF2020 27.287].
3. Williams K, Ingerslev LR, Bork-Jensen J, Wohlwend M, Hansen AN, Small L, Ribel-Madsen R, Astrup A, Pedersen O, Auwerx J, Workman CT, Grarup N, Hansen T, and Barrès R. Skeletal muscle enhancer interactions identify novel genes controlling whole-body metabolism. **Nature Communications**. 2020 Jun 1;11(1):2695. [IF2020 14.919].
4. Sato S, Basse AL, Schöнке M, Chen S, Samad M, Altıntaş A, Laker RC, Dalbram E, Barrès R, Baldi P, Treebak JT, Zierath JR and Sassone-Corsi P. Time of Exercise Specifies the Impact on Muscle Metabolic Pathways and Systemic Energy Homeostasis. **Cell Metabolism**. 2019 July 2, 30:1-19 [IF2019 21.567].
5. Ingerslev LR, Donkin I, Fabre O, Versteyhe S, Mechta M, Pattamaprapanont P, Mortensen B, Krarup N and Barrès R. Endurance training remodels sperm-borne small RNA expression and methylation at neurological gene hotspots. **Clinical Epigenetics**. 2018 Jan 25. [IF2016: 4.987].
6. Nylander V, Ingerslev LR, Andersen E, Fabre O, Garde C, Rasmussen M, Citirikaya K, Bæk J, Christensen G, Aznar M, Specht L, Simar D and Barrès R. Ionizing radiation potentiates high fat diet-induced insulin resistance and reprograms skeletal muscle and adipose progenitor cells. **Diabetes**. September 20, 2016;65(12):3573-3584. [IF2016: 8.684]
7. Donkin I, Versteyhe S, Ingerslev LR, Qian K, Mechta M, Nordkap L, Mortensen B, Appel EV, Jørgensen N, Kristiansen VB, Hansen T, Workman CT, Zierath JR and Barrès R. Obesity and Bariatric Surgery Drive Epigenetic Variation of Spermatozoa in Humans. **Cell Metabolism**. 2016 Feb 9;23(2):369-78. [IF2016: 18.164]. *Highly Cited in Field (Web of Science)*.
8. de Castro Barbosa T, Ingerslev LR, Alm P, Versteyhe S, Massart JM, Rasmussen M, Donkin I, Sjögren R, Mudry JM, Vetterli L, Gupta S, Krook A, Zierath JR and Barrès R. High-fat Diet Transgenerationally Reprograms the Epigenome of Rat Spermatozoa. **Molecular Metabolism**. 2015 Dec 25;5(3):184-97. [IF2015: 5.363].
9. Agudelo L.Z., Femenía T., Orhan F., Porsmyr-Palmertz M., Gojny M., Martinez-Redondo V., Correia J.C., Izadi M., Bhat M., Schuppe-Koistinen I., Pettersson A.T., Ferreira D.M., Krook A., Barrès R., Zierath J.R., Erhardt S., Lindskog M., Ruas J.L. Skeletal Muscle PGC-1 α 1 Modulates Kynurenine Metabolism and Mediates Resilience to Stress-Induced Depression. **Cell**. 2014 Sep 25;159(1):33-45. [IF2014: 32.242].
10. Ng SF, Lin R CY, Laybutt DR, Barrès R, Owens JA and Morris MJ. Chronic high fat diet in fathers programs beta cell dysfunction in female rat offspring. **Nature**. 2010 Oct 21;467(7318):963-6. [IF2010: 36.104].

10 selected publications – Dr. Jean-Louis Nahon

- 1- Cansell C, Stobbe K, Sanchez C, Le Thuc O, Mosser CA, Ben-Fradj S, Leredde J, Lebeaupin C, Debayle D, Fleuriot L, Brau F, Devaux N, Benani A, Audinat E, Blondeau N, **Nahon JL**, Rovère C. Dietary fat exacerbates postprandial hypothalamic inflammation involving glial fibrillary acidic protein-positive cells and microglia in male mice. *Glia*. (2021) 69 : 42-60 doi: 10.1002/glia.23882. Epub 2020 Jul 13.
- 2- Nuzzaci D*, Cansell C*, Liénard F, Nédélec E, Ben Fradj S, Castel J, Foppen E, Denis R, Grouselle D, Laderrière A, Lemoine A, Mathou A, Tolle V, Heurtaux T, Fioramonti X, Audinat E, Pénicaud L, **Nahon JL**, Rovère C, Benani A. Postprandial hyperglycemia stimulates neuroglial plasticity in hypothalamic POMC neurons after a balanced meal. *Cell Rep*. (2020), 30 : 3067-3078 doi: 10.1016/j.celrep.2020.02.029. PMID: 32130907
- 3- Alexander SP, Kelly E, Marrion NV, Peters JA, Faccenda E, Harding SD, Pawson AJ, Sharman JL, Southan C, Buneman OP, Cidlowski JA, Christopoulos A, Davenport AP, Fabbro D, Spedding M, Striessnig J, Davies JA; CGTP Collaborators. THE CONCISE GUIDE TO PHARMACOLOGY 2017/18: Overview. *Br J Pharmacol*. (2017) Dec;174 Suppl 1:S1-S16. doi: 10.1111/bph.13882. PubMed PMID: 29055037
- 4- Le Thuc O, Cansell C, Bourourou M, Denis RGP, Stobbe K, Devaux N, Guyon A, Cazareth J, Heurtaux C, Rostène W, Luquet S, Blondeau N**, **Nahon JL** **#, Rovère C**#. Central CCL2 signaling onto MCH neurons mediates metabolic and behavioral adaptation to inflammation. *EMBO Rep*. (2016) 17, 1738-52 doi: 10.15252/embr.201541499. Epub 2016 Oct 12. PMID: 27733491 (#Co-corresponding auteurs; **Co-directeur(e)s)
- 5- Conductier G*, Brau F*, Viola A*, Langlet F, Ramkuma N, Dehouck B, Lemaire T, Chapot R, Lucas L, Rovère C, Maitre P, Hosseiny S, Petit-Paitel A, Adamantidis A, Lakaye B, Risold PY, Prévo V**, Meste O**, **Nahon JL** **§ and Guyon A**§ Melanin-concentrating hormone regulates beat frequency of ependymal cilia and ventricular volume. *Nature Neurosci* (2013)16 : 845-847 doi: 10.1038/nn.3401 (*Co-auteurs; **§ Co-directeur(e)s)
- 6- Courseaux A., Richard F., Grosgeorge J., Ortola C., Viale A., Turc-Carel C., Dutrillaux B., Gaudray P. and **Nahon JL** Segmental duplications in euchromatic regions of human chromosome 5 : a source of evolutionary instability and transcriptional innovation *Genome Res*. (2003) 13 : 369-381doi: 10.1101/gr.490303. PMID: 12618367
- 7- Courseaux A. and **Nahon JL** Birth of two chimeric genes in the Hominidae lineage, *Science* (2001) 291 : 1293-1297 (Human Genome Issue) doi: 10.1126/science.1057284. PMID: 11181993.
- 8- **Nahon JL**, Presse F., Bittencourt JC, Sawchenko P. and Vale W. The rat melanin-concentrating hormone mRNA encodes multiple putative neuropeptides coexpressed in the dorsolateral hypothalamus. *Endocrinology* (1989), 125 : 2056-2065 doi: 10.1210/endo-125-4-2056. PMID: 2477226.
- 9- **Nahon JL** , Venetianer A. and Sala-Trepat JM. Specific sets of DNase I hypersensitive sites are associated with the potential and overt expression of the rat albumin and alpha-fetoprotein genes. *Proc.Natl.Acad.Sci. (USA)* (1987) 84:2135-2139 doi: 10.1073/pnas.84.8.2135. PMID: 2436225.
- 10- **Nahon, JL**, Gal, A., Erdos, T. and Sala-Trepat, JM Differential DNase I sensitivity of the albumin and alpha-fetoprotein genes in chromatin from rat tissues and cell lines. *Proc.Natl.Acad.Sci. (USA)* (1984), 81 : 5031-5035. doi: 10.1073/pnas.81.16.5031. PMID: 6206492

10 selected publications – Dr. Carole Rovère

1. 2022 Ben Fradj S., Nédélec E., Salvi J., Fouesnard M., Huillet M., Pallot G., Cansell C., Sanchez C., Philippe C., Gigot V., Lemoine A., Trompier D., Henry T., Petrilli V., Py B.F., Guillou H., Loiseau N., Ellero-Simatos S., Nahon J.L., **Rovère C.**, Grober J., Boudry G., Douard V., Benani A. Evidence for a constitutive microbiota-dependent short-term control of food intake in mice: is there a link with inflammation, oxidative stress, endotoxemia, and Glp-1? **ARS**, 2022. Accepté pour publication. **IF 2020/2021 : 8.40**
2. 2021 Negm A., Stobbe K., Fleuriot L., Debayle D., Deval E., Lingueglia E., **Rovère C.**[#], Noël J.[#] Lysophosphatidylcholine induces heat pain hypersensitivity in obese mice fed with a high-fat diet through activation of peripheral Acid-Sensing Ion channel 3. *BioRxiv* preprint doi: <https://doi.org/10.1101/2021.12.07.471593>. [#] co-derniers auteurs.
3. 2021 Duriez P., Nilsson I.A.K., Le Thuc O., Alexandre D., Chartrel N., **Rovère C.**, Chauveau C., Gorwood P., Tolle V., Viltart O. Exploring the mechanisms of recovery in anorexia nervosa through a translational approach: from original ecological measurements in human to brain tissue analyses in mice. **Nutrients**, 13(8):2786. doi: 10.3390/nu13082786. **IF 2020/2021 : 5.72**
4. 2021 Daziano G., Blondeau N., Beraud-Dufour S., Abderrahmani A., **Rovère C.**, Heurteaux C., Mazella J., Lebrun P., Coppola T. Sortilin-derived peptides promote pancreatic beta-cell survival through CREB signaling pathway. **Pharmacol. Res.**, 167:105539. doi: 10.1016/j.phrs.2021.105539. **IF 2020/2021 : 7.66**
5. 2020 Cansell C., Stobbe K., Sanchez C., Le Thuc O., Mosser C.A., Ben-Fradj S., Leredde J., Lebeaupin C., Debayle D., Fleuriot L., Brau F., Devaux N., Benani A., Audinat E., Blondeau N., Nahon J.L., **Rovère C.** Dietary fat exacerbates post-prandial hypothalamic inflammation involving GFAP-positive cells and microglia in male mice. **Glia**, 69(1):42-60. doi: 10.1002/glia.23882. **IF 2018/2019 : 5.83**
6. 2020 Nuzzaci D.[#], Cansell C.[#], Liénard F., Nédélec E., Ben Fradj S., Castel J., Foppen E., Denis R., Grouselle D., Laderrière A., Lemoine A., Mathou A., Tolle V., Heurteaux T., Fioramonti X., Audinat E., Pénicaud L., Nahon J.L., **Rovère C.**, Benani A. Postprandial hyperglycemia stimulates neuroglial plasticity in hypothalamic POMC neurons after a balanced meal. **Cell Rep.**, 30(9):3067-3078. doi: 10.1016/j.celrep.2020.02.029. **IF 2018/2019 : 7.82**
7. 2017 Le Thuc O., Stobbe K., Cansell C., Nahon J.L., Blondeau N., **Rovère C.** Hypothalamic Inflammation and Energy Balance Disruptions: Spotlight on Chemokines. **Front. Endocrinol.** doi:10.3389/fendo.2017.00197. **IF 2017 : 3.68** - review
8. 2017 Méquinion M., Le Thuc O., Zgheib S., Alexandre D., Chartrel N., **Rovère C.**, Hardouin P., Viltart O., Chauveau C. Long term energy deficit in mice causes long-lasting hypothalamic alterations after recovery. **Neuroendocrinology** doi: 10.1159/000455048. **IF 2016/2017 : 3.61**
9. 2016 Le Thuc O., Cansell C., Bourourou M., Denis R.G.P., Stobbe K., Devaux N., Guyon A., Cazareth J., Heurteaux C., Rostène W., Luquet S., Blondeau N., Nahon J.L., **Rovère C.** Central CCL2 signaling onto MCH neurons mediates metabolic and behavioral adaptation to inflammation. **EMBO Rep.** Oct 12. pii: e201541499. **IF 2015/16 : 7.74**
10. 2016 Gorwood P., Blanchet-Collet C., Chartrel N., Duclos J., Dechelotte P., Hanachi M., Fetissov S., Godart N., Melchior J.C., Ramoz N., **Rovère-Jovène C.**, Tolle V., Viltart O., Epelbaum J. New insights into Anorexia Nervosa Research. **Front. Neurosci.** doi: 10.3389/fnins.2016.00256 **IF 2015 : 3.66** – revue

10 selected publications – Assist. Prof. Ali Altıntaş

1. Gabriel, B. M., **Altıntaş, A.**, Smith, J. A. B., Sardon-Puig, L., Zhang, X., Basse, A. L., Laker, R. C., Gao, H., Liu, Z., Dollet, Lucile, Treebak, Jonas Thue, Zorzano, A., Huo, Z., Rydén, M., Lanner, J. T., Esser, K. A., Barrès, Romain, Pilon, N. J., Krook, A., Zierath, Juleen R (2021) *Science Advances*, DOI: <https://doi.org/10.1126/sciadv.abi9654>, PMID: 34669477
2. **Altıntaş, A.**, Liu, J., Fabre, O., Chuang, T., Wang, Y., Sakurai, R., Chehabi, G. N., Barrès, R., Rehan, V. K. (2021) Perinatal exposure to nicotine alters spermatozoal DNA methylation near genes controlling nicotine action. *FASEB Journal*, DOI: <https://doi.org/10.1096/fj.202100215R>, PMID: 34153130
3. Laker, R. C. C., **Altıntaş, A.**, Lillard, T. S., Zhang, M., Connelly, J. J., Sabik, O. L., Onengut, S., Rich, S. S., Farber, C. R., Barrès, R., Yan, Z. (2021) Exercise during pregnancy mitigates negative effects of parental obesity on metabolic function in adult mouse offspring. *Journal of Applied Physiology*, DOI: <https://doi.org/10.1152/jappphysiol.00641.2020>, PMID: 33332990
4. **Altıntaş, A.**, Laker, R. C., Garde, C., Barrès, R., Zierath, J. R. (2020) Transcriptomic and Epigenomic Atlas of Myotubes Reveals Insight into the Circadian Control of Metabolism and Development. *Epigenomics*, DOI: <https://doi.org/10.2217/epi-2019-0391>, PMID: 32157909
5. Lundell, L. S., Parr, E. B., Devlin, B. L., Ingerslev, L. R., **Altıntaş, A.**, Sato, S., Sassone-Corsi, P., Barrès, R., Zierath, J. R., Hawley, J. A. (2020) Time-restricted feeding alters lipid and amino acid metabolite rhythmicity without perturbing clock gene expression. *Nature Communications*, DOI: <https://doi.org/10.1038/s41467-020-18412-w>, PMID: 33033267
6. Small, L., **Altıntaş, A.**, Laker, R. C., Ehrlich, A., Pattamaprapanont, P., Villarroel, J., Pilon, N. J., Zierath, J. R., Barrès, R. (2020) Contraction influences Per2 gene expression in skeletal muscle through a calcium-dependent pathway. *Journal of Physiology*, DOI: <https://doi.org/10.1113/JP280783>, PMID: 32939754
7. Sato, S., Basse, A. L., Schönke, M., Chen, S., Samad, M., **Altıntaş, A.**, Laker, R. C., Dalbram, E., Barrès, R., Baldi, P., Treebak, J. T., Zierath, J. R. (2019) Time of Exercise Specifies the Impact on Muscle Metabolic Pathways and Systemic Energy Homeostasis. *Cell Metabolism*, DOI: <https://doi.org/10.1016/j.cmet.2019.03.013>, PMID: 31006592
8. Dollerup, O. L., Chubanava, S., Agerholm, M., Søndergård, S. D., **Altıntaş, A.**, Møller, A. B., Høyer, K. F., Ringgaard, S., Stødkilde-Jørgensen, H., Lavery, G. G., Barrès, R., Larsen, S., Prats, C., Jessen, N., Treebak, J. T. (2019) Nicotinamide riboside does not alter mitochondrial respiration, content or morphology in skeletal muscle from obese and insulin-resistant men. *The Journal of Physiology*, DOI: <https://doi.org/10.1113/JP278752>, PMID: 31710095
9. Andersen, E., Ingerslev L. R., Fabre, O., Donkin, I., **Altıntaş, A.**, Versteyhe, S., Bisgaard, T., Kristiansen, V. B., Simar, D., Barrès, R. (2018) Preadipocytes from obese humans with type 2 diabetes are epigenetically reprogrammed at genes controlling adipose tissue function. *International Journal of Obesity*, DOI: <https://doi.org/10.1038/s41366-018-0031-3>, PMID: 29511320
10. **Altıntaş, A.**, Davidsen, K., Garde, C., Mortensen, U. H., Brasen, J. C., Sams, T., Workman, C. T. (2016) High-resolution kinetics and modeling of hydrogen peroxide degradation in live cells. *Free Radical Biology and Medicine*, DOI: <http://dx.doi.org/10.1016/j.freeradbiomed.2016.10.006>, PMID: 27742413

10 Selected publication – Assist. Prof. Kristine Williams

- 1- Wohlwend M, Laurila P, **Williams K**, Romani M, Lima T, Pattawaran P, Benegiamo G, Salonen M, Schneider BL, Lahti J, Eriksson JG, Barrès R, Wisløff U, Moreira JBN, Auwerx J. The exercise-induced long noncoding RNA CYTOR promotes fast-twitch myogenesis in aging. **Sci Transl Med**. 2021 Dec 8;13(623):eabc7367. doi: 10.1126/scitranslmed.abc7367. Epub 2021 Dec 8.
- 2- **Williams K**, Carrasquilla GD, Ingerslev LR, Hochreuter MY, Hansson S, Pilon NJ, Donkin I, Versteyhe S, Zierath JR, Kilpeläinen TO, Barrès R. Epigenetic rewiring of skeletal muscle enhancers after exercise training supports a role in whole-body function and human health. **Mol Metab**. 2021 Nov;53:101290. doi: 10.1016/j.molmet.2021.101290. Epub 2021 Jul 10.
- 3- **Williams K**, Ingerslev LR, Bork-Jensen J, Wohlwend M, Hansen AN, Lewin Small, Ribel-Madsen R, Astrup A, Pedersen O, Auwerx J, Workman CT, Grarup N, Hansen T, Barrès R. Skeletal muscle enhancer interactions identify genes controlling whole-body metabolism. **Nat Commun**. 2020 Jun 1;11(1):2695.
- 4- Wu X, Bekker-Jensen IH, Christensen J, Rasmussen KD, Sidoli S, Qi Y, Kong Y, Wang X, Cui Y, Xiao Z, Xu G, **Williams K**, Rappsilber J, Sønderby CK, Winther O, Jensen ON, Helin K. Tumor suppressor ASXL1 is essential for the activation of INK4B expression in response to oncogene activity and anti-proliferative signals. **Cell Res**. 2015 Nov;25(11):1205-18.
- 5- **Williams K**, Christensen J, Rappsilber J, Johansen JV, Nielsen AL, Helin K. The histone lysine demethylase JMJD3/KDM6B is recruited to p53 bound promoters and enhancer elements in a p53 dependent manner. **PLoS One**. 2014 May 5;9(5):e96545
- 6- Vella P, Scelfo A, Jammula S, Chiacchiera F, **Williams K**, Cuomo A, Roberto A, Christensen J, Bonaldi T, Helin K, Pasini D. Tet proteins connect the O-linked N-acetylglucosamine transferase Ogt to chromatin in embryonic stem cells. **Mol Cell**. 2013 Feb 21;49(4):645-56
- 7- **Williams K**, Christensen J, Helin K. DNA methylation: TET proteins-guardians of CpG islands? **EMBO Rep**. 2011 Dec 23;13(1):28-35.
- 8- **Williams K**, Christensen J, Pedersen MT, Johansen JV, Cloos PA, Rappsilber J, Helin K. TET1 and hydroxymethylcytosine in transcription and DNA methylation fidelity. **Nature**. 2011 May 19;473(7347):343-8.
- 9- Agger K, Cloos PA, Rudkjaer L, **Williams K**, Andersen G, Christensen J, Helin K. The H3K27me3 demethylase JMJD3 contributes to the activation of the INK4A-ARF locus in response to oncogene- and stress-induced senescence. **Genes Dev**. 2009 May 15;23(10):1171-6.

Valbonne, 23 Mai 2022

Pour servir ce que de droit

En 1989, l'IPMC a été créé en tant qu'Unité propre de recherche du CNRS. Le premier bâtiment de 4 700 m² accueillait à l'origine 6 équipes de recherche et 98 personnes. Aujourd'hui l'IPMC est une Unité mixte de recherche CNRS Université Côte d'Azur. En 2008, une extension de 3 300 m² a été bâtie. Les deux bâtiments totalisant 8000 m² abritent aujourd'hui 20 équipes de recherche et plusieurs plateformes techniques dont une plateforme génomique qui appartient à France Génomique, une infrastructure nationale créée comme les LabEx Signalife, ICST et DistAlz, hébergés dans l'IPMC, dans le cadre des Investissements d'Avenir. L'équipe actuelle de 213 personnes comprend 85 chercheurs et professeurs permanents, 45 techniciens et ingénieurs, 21 post-doctorants et 35 doctorants. En 30 ans, l'IPMC a produit une grande quantité de résultats scientifiques (> 2 300 publications, > 150 brevets), et a formé de nombreux personnels (93 doctorats et 23 post-doctorants au cours des cinq dernières années). Le nombre de récompenses obtenues est absolument considérable, avec pour les seules cinq dernières années 44 Prix/décorations dont deux médailles de bronze et un cristal du CNRS, une nomination dans l'ordre national du Mérite et deux nominations au grade de Chevalier dans l'ordre national de la Légion d'honneur.

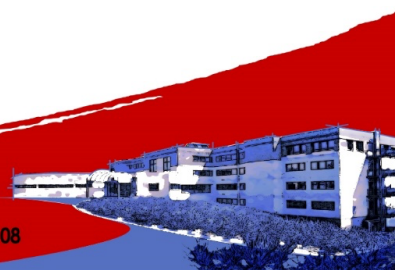
La demande de création d'un « International Research Project (IRP) » par le Dr Romain Barrès intervient dans le contexte de renforcement synergétique du « pool » d'équipes et des collaborations internationales de l'IPMC. Cette demande représente ainsi un élément clé de notre politique de développement interne et externe.

Le Dr R Barrès a démontré une capacité remarquable à animer une recherche du plus haut niveau international et à lever des fonds conséquents pour développer ses travaux au CRBM-Université de Copenhague. Il a construit un réseau mondial de qualité, centré autour du consortium GECKO. La thématique de ses travaux elle-même est centrale pour l'évolution future de l'IPMC. Elle s'inscrit dans le concept « One health » dans lequel l'organisme est considéré dans sa globalité et dans son environnement pour la prise en charge de sa santé. Les désordres métaboliques et notamment l'obésité fait le lit de nombreuses autres pathologies. Cette dimension était déjà étudiée à l'IPMC et sera ainsi renforcée dans sa composante épigénétique. En effet, le Dr R Barrès étudie les relations entre épigénétique et métabolisme ce qui est d'actualité, et en forte adéquation avec la plateforme génomique et les équipes de l'IPMC qui s'intéressent à la pharmacogénétique. Incidemment, le Dr R Barrès collabore déjà fortement avec mon équipe dont les locaux actuels seront dédiés à l'accueil et au développement de son équipe en 2023, dans laquelle C Rovere et moi-même seront intégrés. Au plan national la thématique centrale de l'équipe de Romain Barrès, liant les mécanismes épigénétiques à la propagation trans-générationnelle des désordres du métabolisme, n'est pas abordée comme on pourrait le souhaiter. Son développement en France, et tout particulièrement dans une Unité reconnue de l'INSB, permettra de combler ce retard, donnera un coup d'accélérateur aux travaux de ce type et offrira une grande visibilité internationale.

En conclusion j'appuie très fortement cette demande comme chef d'équipe et Directeur d'Unité.



Dr Nahon Jean-Louis
Directeur de Recherche CNRS/DRCE1
Directeur de l'équipe GENE, IPMC
Directeur de l'IPMC



Romain Barrès

ResearcherID N-2501-2016
ORCID 0000-0002-0158-519X

French citizen
Married, two children

DEGREES

- | | |
|------|--|
| 2006 | PhD in Molecular Biology, University of Nice Sophia Antipolis, France.
Highest Distinction. |
| 2001 | Master's Degree in Pharmacology, University of Nice Sophia Antipolis, France.
First of class (1/46 students). |
| 1999 | Bachelor of Science in Physiology, University of Toulouse Paul Sabatier, France.
First of class (1/654 students). |

TRAINING

- | | |
|------|---|
| 2022 | Coaching with the Enneagram 1.0. Ginger Lapid-Bogda – 40.5 ICF ACSTH points |
| 2012 | Leadership and Management Course for Group Leaders. <i>hfp consulting</i> . Copenhagen. |
| 2010 | Foundations of University Learning and Teaching (FULT). University of New South Wales. |
| 2009 | Laboratory Animal Science course (FELASA C). Karolinska Institutet. |

EMPLOYMENT HISTORY

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|---------|---|
| 2022- | Director of Research, Centre National pour la Recherche Scientifique (CNRS),
Institut de Pharmacologie Moléculaire et Cellulaire, Sophia Antipolis |
| 2018- | Professor of Metabolic Epigenetics
CBMR, Faculty of Health and Medical Sciences, University of Copenhagen |
| 2012-18 | Associate Professor
CBMR, Faculty of Health and Medical Sciences, University of Copenhagen |
| 2010-12 | Assistant Professor
CBMR, Faculty of Health and Medical Sciences, University of Copenhagen |
| 2010- | Visiting Fellow
School of Medical Sciences, Faculty of Medicine, University of New South Wales Sydney |
| 2009-10 | Lecturer
School of Medical Sciences, Faculty of Medicine, University of New South Wales Sydney |
| 2006-09 | Postdoctoral Fellow
Karolinska Institutet, Stockholm |

EXECUTIVE LEADERSHIP ACTIVITIES

- | | |
|-----------|---|
| 2019- | Program Coordinator. Program coordinators supervise the implementation and development of the 4 Research Programs within CBMR. These roles entail moderating Program meetings, communicating with Research Area coordinators (Group Leaders), defining the research strategy, the identification of flagship projects and allocating research funds (up to DKK10million/year) for thereof. |
| 2017-2018 | Chair of the Faculty Forum. The Chair of the Faculty Forum is elected by the 17 Group Leaders of CBMR. The Chair oversees the operation of the Faculty Forum and is a member of the Management Committee constituted by the Executive Director, the Vice-Executive Director, the five Scientific Directors and the Chief Administrative Officer.

Tasks: Strategy development / Allocation of internal synergy grants / Facilitation of internal and external collaborations / Planning and organization of scientific events and conferences / Writing the 5-year grant package application to the Novo Foundation. |

- 2010-18 **Deputy Scientific Director, Section of Integrative Physiology.** CBMR is organised in 5 Sections: Integrative Physiology, Metabolic Genetics, Metabolic Imaging and Liver Metabolism and Metabolic Receptology and Science Communication
- Tasks: Establishing and implementing the research strategy for the Section / Recruitment and supervision of senior researchers and professional staff / Planning and management of the Section's budget / Planning and development of the laboratory infrastructure / Managing operation and budget for the sequencing platform / Ensuring compliance to health and safety / Ensuring high research quality standards.
- 2010- **Group Leader, Environmental Epigenetics Lab.** 15 scientists (4 PhD students, 5 Postdocs, 4 Bioinformaticians, 1 lab technician and 1 Senior Research Officer).
- Tasks: Establishing and implementing the research strategy / Fundraising / Recruitment and management of all staff / Organization of laboratory events and retreats / Moderation of weekly meetings / Participation to scientific conferences / Providing research-based teaching / Engagement in the University's external academic activities.
- 2009-10 **Member of the Honours Committee (UNSW).**
- Tasks: Working with administrative staff to improve the systems for increased efficiency / Communicating program rules to the tutors / Frequent liaising with students and administration units / Participation in initiatives related to student recruitment.
- 2009-10 **Lecturer and Group Leader, Environmental Epigenetics Lab (UNSW).**
- Tasks: Establishing and implementing research / Supervision of research students / Fundraising / Convening courses and teaching for the Exercise Physiology courses.

COMMISSION OF TRUST

Member of the Advisory Board of the [Diabetes Research & Wellness Foundation](#).
 Advisor for the biotech company *Ohana Bioscience* (located on the MIT campus, USA).
 Chair of the assessment committee for the Professorship of Prof. Kei Sakamoto to the University of Copenhagen.

TEACHING CURRICULUM

- 2016- Consultant for *hfp consulting* "Leadership and Management Skills Course" at Massachusetts Institute of Technology (MIT), Boston, USA and EMBO, Heidelberg, Germany.
- 2016- Lectures and tutorials for the Copenhagen Bioscience PhD programme, University of Copenhagen.
- 2010- Lectures for PhD Course *Molecular Genetics in Metabolic Diseases*, University of Copenhagen.
- 2009-10 Lecturer, Faculty of Medicine, UNSW Australia, (380 hrs).
- 2004-05 Associate Lecturer, University of Nice Sophia Antipolis, Nice, France. (150 hrs).

INVITED LECTURES (past 5 years)

- 2017 Summer School from the EGID (Genomic Diabetes Institute). Lille, France.
- 2016 School of the European Obesity Association. Warsaw, Poland.
- 2014 European Society of Endocrinology - Summer School 2014. Bregenz, Austria.
- 2014 Course 1790: Exercise in the management and prevention of metabolic diseases. Karolinska Institutet, Stockholm, Sweden.
- 2014 Riken (Japan)/Karolinska Institute Alliance Lectures. Stockholm, Sweden.
- 2013 Steno Diabetes Center. Steno rounds Lecture. Copenhagen, Denmark.
- 2013 Leipzig Epigenetics Spring School 2013. Leipzig, Germany.

PUBLICATIONS

79 publications. 7 as first and 34 as last author.

2 publications marked as *Highly Cited in Field* (Web of Science)

As of 1st of May 2021:

Average Citations per Article: 63.27

h-index: 29

(source: Web of Science)

Research Articles

- Andersen E, Juhl CR, Kjølner ET, Lundgren JR, Janus C, Dehestani Y, Saupstad M, Ingerslev LR, Duun OR, Jensen SBK, Holst JJ, Stallknecht BM, Madsbad S, Torekov SS, Barrès R. Sperm count is increased by diet-induced weight loss and maintained by exercise or GLP-1 analogue treatment: a randomised controlled trial. **Human Reproduction**. 2022 May 17:deac096. [IF2020 6.918].
- McIlvenna LC, Altıntaş A, Patten RK, McAinch AJ, Rodgers RJ, Stepto NK, Barrès R[#] and Moreno-Asso A[#]. TGFβ1 impairs the transcriptomic response to contraction in myotubes from women with polycystic ovary syndrome. **The Journal of Physiology**. In press. [IF2020 5.182]. [#]corresponding author.
- Small L, Ehrlich A, Iversen J, Ashcroft SP, Trošt K, Moritz T, Hartmann B, Holst JJ, Treebak JT, Zierath JR, Barrès R. Comparative analysis of oral and intraperitoneal glucose tolerance tests in mice. **Molecular Metabolism**. 2022 Jan 11;57:101440. [IF2020 7.422].
- Villarroel J, Donkin I, Champion C, Burcelin R and Barrès R. Endurance training in humans modulates the bacterial DNA signature of skeletal muscle. **Biomedicines**. 2021 Dec 29;10(1):64. [IF2020 6.081].
- Sato S, Dyar KA, Treebak JT, Jepsen SL, Ehrlich AM, Ashcroft SP, Trost K, Kunzke T, Prade VM, Small L, Basse AS, Schönke M, S Chen, Samad M, Baldi P, Barrès R, Walch A, Moritz T, Holst JJ, Lutter D, Zierath JR, Sassone-Corsi P. Atlas of Exercise Metabolism Reveals Time-Dependent Signatures of Metabolic Homeostasis. **Cell Metabolism**. 2022 Feb 1; 34(2):329-345 [IF2020 27.287].
- Wohlfend M, Williams K, Laurila PP, Romani M, Pattawaran P, Benegiamo G, Schneider BL, Barrès R, Wisløff U, Moreira JBN, Auwerx J. The exercise-induced long noncoding RNA CYTOR promotes fast-twitch myogenesis in aging. **Science Translational Medicine**. 2021 Dec 8;13(623):eabc7367. [IF2021 17.956].
- Moreno-Asso A, Altıntaş A, McIlvenna LC, Patten RK, Botella J, McAinch AJ, Rodgers RJ, Barrès R* and Stepto NK*. Non-cell Autonomous Mechanisms Control Mitochondrial Gene Dysregulation in Polycystic Ovary Syndrome. **Journal of Molecular Endocrinology**. 2021 Dec 3;68(1):63-76. *Co-last authors. [IF2020 5.098].
- Dall M, Hassing AS, Niu L, Nielsen TS, Ingerslev LR, Sulek K, Trammel SAJ, Gillum MP, Barrès R, Larsen S, Poulsen SS, Mann M, Ørskov C, Treebak JT. Hepatocyte-specific perturbation of NAD⁺ biosynthetic pathways in mice induces reversible non-alcoholic steatohepatitis-like phenotypes. **Journal of Biological Chemistry**. 2021 Nov 8;297(6):101388. [IF2020 5.157].
- Isidor M, Dong W, Uribe RS, Villarroel J, Altıntaş A, Ayala-Summano JT, Varela-Echavarría A, Barrès R, Stephanopoulos G, Macotela Y, and Emanuelli B. Insulin resistance rewires the metabolic gene program and glucose utilization in human white adipocytes. **International Journal of Obesity**. 2021 Nov 19. [IF2020 5.095].
- Sjögren RJO, Massart J, Egan B, Garde C, Lindgren M, Gu W, Barrès R, O’Gorman DJ, Zierath JR, and Krook A. Endurance Exercise Training-Responsive miR-19b-3p Improves Skeletal Muscle Glucose Metabolism. **Nature Communications**. 2021 Oct 12;12(1):5948. [IF2020 14.919].
- Gabriel BM, Altıntaş A, Sardon-Puig L, Smith JAB, Zhang X, Basse AL, Laker RC, Gao H, Liu Z, Dollet L, Treebak JT, Zorzano A, Huo Z, Rydén M, Lanner JT, Esser KA, Barrès R, Pilon NJ, Krook A, Zierath JR. Disrupted Circadian Oscillations in Type 2 Diabetes are Linked to Altered Rhythmic Mitochondrial Metabolism in Skeletal Muscle. **Science Advances**. 2021 Oct 22;7(43):eabi9654. [IF2020 14.136].
- Williams K, Carrasquilla GD, Ingerslev LR, Hochreuter MY, Pilon NJ, Donkin I, Versteyhe S, Zierath JR, Kilpeläinen TO, and Barrès R. Epigenetic rewiring of skeletal muscle enhancers after exercise training supports a role in whole-body function and human health. **Molecular Metabolism**. 2021 Jul 10;53:101290. [IF2020 7.422].

13. Basse AL, Agerholm M, Farup J, Dalbram E, Nielsen J, Ørtenblad N, Altintas A, Ehrlich AM, Krag T, Bruzzzone S, Dall M, de Guia RM, Jensen JB, Møller AB, Karlsen A, Kjær M, Barrès R, Vissing J, Larsen S, Jessen N, Treebak JT, Nampt controls skeletal muscle development by maintaining Ca²⁺ homeostasis and mitochondrial integrity. **Molecular Metabolism**. 2021 Jun 11;53:101271. [IF2020 7.422].
14. Altıntaş A, Liu J, Fabre O, Chuang TD, Wang Y, Sakurai R, Nazih Chehabi C, Barrès R*, and Rehan VK*. Perinatal exposure to nicotine alters spermatozoal DNA methylation near genes controlling nicotine action. **FASEB Journal**. 2021 Jul;35(7):e21702. * Co-last author [IF2020 5.191].
15. Lundh M, Altıntaş A, Fabre O, Ma T, Shamsi F, Gerhart-Hines F, Barrès R, Tseng YH, Emanuelli B. Cold-induction of Afadin in Brown Fat supports its thermogenic capacity. **Scientific Reports**. 2021 May 7;11(1):9794. [IF2020 4.379].
16. Borup Roland C, de Place Knudsen S, Alomairah SA, Andersen AD, Bendix J, Clausen TD, Molsted S, Jensen AK, Teilmann G, Jespersen AP, Larsen JE, van Hall G, Andersen A, Barrès R, Mortensen OL, Maindal HT, Tarnow L, Løkkegaard ECL, Stallknecht B. Structured supervised exercise training or motivational counselling during pregnancy on physical activity level and health of mother and offspring: FitMum study protocol. **BMJ Open**. 2021 Mar 19;11(3):e043671. [IF2020 2.692].
17. Small L, Ingerslev LR, Manitta E, Laker RC, Hansen AN, Deeney B, Carrié A, Couvert P and Barrès R. Ablation of DNA-methyltransferase 3A in skeletal muscle does not affect energy metabolism or exercise capacity. **PLoS Genetics**. 2021 Jan 29;17(1):e1009325. [IF2019 5.175].
18. Laker RC, Altıntaş A, Lillard TS, Zhang M, Connelly JJ, Sabik OL, Onengut S, Rich SS, Farber CR, Barrès R and Yan Z. Exercise during pregnancy mitigates negative effects of parental obesity on metabolic function in adult mouse offspring. **Journal of Applied Physiology**. 2021 Mar 1;130(3):605-616. [IF2020 3.531].
19. Rabiee A, Plucińska K, Isidor MS, Brown EL, Tozzi M, Sidoli S, Petersen PS, Agueda-Oyarzabal M, Torsetnes SB, Chehabi C, Lundh M, Altıntaş A, Barrès R, Jensen ON, Gerhart-Hines Z and Emanuelli B. Remodeling of white fat during browning involves YBX1 to drive thermogenic commitment. **Molecular Metabolism**. 2020 Dec 5:101137. [IF2020 7.422].
20. Small L, Altıntaş A, Laker RC, Ehrlich A, Pattamaprapanont P, Villarroel J, Pilon NJ, Zierath JR and Barrès R. Contraction influences Per2 gene expression in skeletal muscle through a calcium-dependent pathway. **The Journal of Physiology**. 2020 Dec;598(24):5739-5752. [IF2020 5.182].
21. Lundell LS, Parr EB, Devlin BL, Ingerslev LR, Altıntaş A, Sato S, Sassone-Corsi P, Barrès R, Zierath JR and Hawley JA. Time-Restricted Feeding Alters Lipid and Amino Acid Metabolite Rhythmicity in Men. **Nature Communications**. 2020 Oct 8;11(1):5142. [IF2020 14.919].
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23. Williams K, Ingerslev LR, Bork-Jensen J, Wohlwend M, Hansen AN, Small L, Ribel-Madsen R, Astrup A, Pedersen O, Auwerx J, Workman CT, Grarup N, Hansen T, and Barrès R. Skeletal muscle enhancer interactions identify novel genes controlling whole-body metabolism. **Nature Communications**. 2020 Jun 1;11(1):2695. [IF2020 14.919].
24. Altıntaş A, Laker RC, Garde C, Barrès R and Zierath JR. Transcriptomic and epigenomic atlas of myotubes reveals insight into the circadian control of metabolism and development. **Epigenomics**. 2020 Apr;12(8):701-713. [IF2020 4.778].
25. Alligier M, Barrès R, [...] and Laville M. OBEDIS CORE VARIABLES PROJECT: European expert guidelines on a minimal core set of variables to include in randomized, controlled clinical trials of obesity interventions. **Obesity Facts**. 2020 Jan 16:1-28. [IF2020 3.942].
26. Jacobsen MJ, Havgaard JH, Anthon C, Junker-Wentzel C, Cirera S, Sørensen P, Pundhir S, Karlskov-Mortensen P, Bruun C, Lesnik P, Guerin M, Gorodkin J, Jorgensen CB, Fredholm M and Barrès R. Epigenetic and transcriptomic characterization of pure adipocyte fractions from obese pigs identifies candidate pathways controlling metabolism. **Frontiers in Genetics**. 2019 Dec 17;10:1268. [IF2019 3.260].
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31. Sato S, Basse AL, Schönke M, Chen S, Samad M, Altıntaş A, Laker RC, Dalbram E, Barrès R, Baldi P, Treebak JT, Zierath JR and Sassone-Corsi P. Time of Exercise Specifies the Impact on Muscle Metabolic Pathways and Systemic Energy Homeostasis. **Cell Metabolism**. 2019 July 2, 30:1-19 [IF2019 21.567].
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33. de Castro Barbosa T, Alm PS, Krook A, Barrès R and Zierath JR. Paternal High-Fat Diet Transgenerationally Impacts Hepatic Immunometabolism. **FASEB Journal**. 2019 May;33(5):6269-6280. [IF2019 4.966].
34. Andersen E, Ingerslev L, Fabre O, Donkin I, Altintas A, Versteyhe S, Kristiansen VB, Bisgaard T, Simar D, and Barrès R. Preadipocytes from obese humans with type 2 diabetes are epigenetically reprogrammed at genes controlling adipose tissue function. **International Journal of Obesity**. 2019 Feb 20. [IF2019 4.419].
35. Daniel S, Nylander V, Ingerslev LR, Zhong L, Fabre O, Clifford B, Johnston K; Cohn RJ, Barrès R*, Simar D. T-cell epigenetic remodeling and accelerated epigenetic aging are linked to long-term immune alterations in childhood cancer survivors. **Clinical Epigenetics**. 2018 Nov 6; 10(1):138. * Co-last author [IF2018: 5.496].
36. Poupeau A, Garde C, Sulek K, Citirikaya K, Treebak JT, Arumugam M, Simar D, Bäckhed F and Barrès R. Genes controlling the activation of natural killer lymphocytes are epigenetically remodeled in intestinal cells from germ-free mice. **FASEB Journal**. 2018 Oct 10: fj201800787R. [IF2016 5.595].
37. Fabre O, Ingerslev LR, Garde C, Donkin I, Simar D, and Barrès R. Exercise training alters the genomic response to acute exercise in human adipose tissue. **Epigenomics**. 2018 Apr 19. [IF2016 4.541].
38. Mechta M, Ingerslev LR and Barrès R. Methodology for Accurate Detection of Mitochondrial DNA methylation. **JoVE - Journal of Visualized Experiments**. 2018 May 20;(135). [IF2016 1.232].
39. Ingerslev LR, Donkin I, Fabre O, Versteyhe S, Mechta M, Pattamaprapanont P, Mortensen B, Krarup N and Barrès R. Endurance training remodels sperm-borne small RNA expression and methylation at neurological gene hotspots. **Clinical Epigenetics**. 2018 Jan 25. [IF2016: 4.987].
40. Laker RC, Garde C, Camera D, Smiles W, Zierath JR, Hawley JA and Barrès R. Transcriptomic and epigenetic responses to short-term nutrient-exercise stress in humans. **Scientific Reports**. 2017 Nov 9;7(1):15134. [IF2016: 4.259].
41. Mechta M, Ingerslev LR, Fabre O, Picard M and Barrès R. Evidence suggesting absence of mitochondrial DNA methylation. **Frontiers in Genetics**. 2017 Nov 1;8:166. [IF2016: 3.789].
42. Machado L, Esteves de Lima J, Fabre O, Proux C, Legendre R, Szegedi A, Varet H, Ingerslev L, Barrès R, Relaix F and Mourikis P. In situ fixation redefines quiescence and early activation of skeletal muscle stem cells. **Cell Reports**. 2017 Nov 14;21(7):1982-1993. [IF2016: 8.282].
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44. Pattamaprapanont P, Garde C, Fabre O and Barrès R. Muscle contraction induces acute hydroxymethylation of the exercise-responsive gene Nr4a3. **Frontiers in Endocrinology**. 2016 Dec 23;7:165. [IF2016: 3.675].
45. Nylander V, Ingerslev LR, Andersen E, Fabre O, Garde C, Rasmussen M, Citirikaya K, Bæk J, Christensen G, Aznar M, Specht L, Simar D and Barrès R. Ionizing radiation potentiates high fat diet-induced insulin resistance and reprograms skeletal muscle and adipose progenitor cells. **Diabetes**. September 20, 2016;65(12):3573-3584. [IF2016: 8.684].

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47. Kirchner H, Sinha I, Gao H, Ruby MA, Schönke M, Lindvall JM, Barrès R, Krook A, Näslund E, Dahlman-Wright K, Zierath JR. Altered DNA methylation of glycolytic and lipogenic genes in liver from obese and type 2 diabetic patients. **Molecular Metabolism**. 2016 Jan 2;5(3):171-83. [IF2016: 6.799].
48. Jacobsen MJ, Junker Mentzel CM, Olesen AS, Huby T, Jørgensen CB, Barrès R, Fredholm M, and Simar D. Altered methylation profile of lymphocytes is concordant with perturbation of lipids metabolism and inflammatory response in obesity. **Journal of Diabetes Research**. 2016;2016:8539057. [IF2016: 2.717].
49. de Castro Barbosa T, Ingerslev LR, Alm P, Versteyhe S, Massart JM, Rasmussen M, Donkin I, Sjögren R, Mudry JM, Vetterli L, Gupta S, Krook A, Zierath JR and Barrès R. High-fat Diet Transgenerationally Reprograms the Epigenome of Rat Spermatozoa. **Molecular Metabolism**. 2015 Dec 25;5(3):184-97. [IF2015: 5.363].
50. Caillaud C, Mechta M, Ainge H, Madsen A, Ruell P, Mas E, Bisbal C, Mercier J, Stephen T, Mori TA, Simar D and Barrès R. Chronic erythropoietin treatment improves diet-induced glucose intolerance in rats. **Journal of Endocrinology**. 2015 May;225(2):77-88. [IF2015: 4.498].
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54. Barrès R, Kirchner H., Rasmussen M., Yan J., Kantor F.R., Krook A., Näslund E., Zierath J.R. Weight loss after gastric bypass surgery in human obesity remodels promoter methylation. **Cell Reports**. 2013 Apr 25;3(4):1020-7. [IF2013: 7.207].
55. Barrès R, Yan J., Egan B., Treebak JT, Rasmussen R., Fritz T., Caidahl K., Krook A., O’Gorman DJ and Zierath JR. Acute Exercise Remodels Promoter Methylation in Human Skeletal Muscle. **Cell Metabolism**. 2012 March 7;15(3):405-11. [IF2012: 14.619]. [Highly Cited in Field \(Web of Science\)](#).
56. Galuska D, Pirkmajer S, Barrès R, Ekberg K, Wahren J and Chibalin AV. C-peptide increases Na,K-ATPase expression via PKC- and MAP kinase-dependent activation of transcription factor ZEB in human renal tubular cells. **PLoS ONE**. 2011;6(12):e28294.[IF2011: 4.092].
57. Yan J, Zierath JR and Barrès R. Evidence for non-CpG methylation in mammals. **Experimental Cell Research**. 2011 Nov 1;317(18):2555-61. [IF2011: 3.580].
58. Czepluch FS, Barrès R, Caidahl K, Olieslagers S, Krook A, Rickenlund A, Zierath JR and Waltenberger J. Strenuous physical exercise adversely affects monocyte chemotaxis. **Journal of Thrombosis and Haemostasis**. 2011 Jan 3: 122-30. [IF2011: 5.731].
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61. Barrès R, Osler ME, Yan J, Rune A, Fritz T, Caidahl K, Krook A and Zierath JR. Non-CpG methylation of the PGC-1 α promoter through DNMT3B controls mitochondrial density. **Cell Metabolism**. 2009 Sep;10(3):189-98. [IF2009: 17.350].
62. Galuska D, Kotova O, Barrès R, Chibalina DV, Benziane B and Chibalin AV. Altered expression and insulin-induced trafficking of Na,K-ATPase in rat skeletal muscle: effects of high fat diet and exercise.

American Journal of Physiology, Endocrinology and Metabolism. 2009 Jul;297(1):E38-49. [IF2009: 4.395].

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64. Barrès R, Grémeaux T, Gual P, Gonzalez T, Gugenheim J, Tran A, Le Marchand-Brustel Y and Tanti JF. Enigma interacts with adaptor protein with PH and SH2 domains to control insulin-induced actin cytoskeleton remodeling and glucose transporter 4 translocation. **Molecular Endocrinology.** 2006 Nov;20(11):2864-75. [IF2006: 4.967].
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66. Gual P, Gonzalez T, Grémeaux T, Barrès R, Le Marchand-Brustel Y and Tanti JF. Hyperosmotic stress inhibits insulin receptor substrate-1 function by distinct mechanisms in 3T3-L1 adipocytes. **Journal of Biological Chemistry.** 2003 Jul 18;278(29):26550-7. [IF2003: 6.482].

Review/Commentary Articles

67. Epigenetics: opportunities for the clinic. Barrès R. **Danish Dental Journal** (Tandlaegebladet). *In press.*
68. Epigenetic changes in healthy human skeletal muscle following exercise— a systematic review. Jacques M, Hiam D, Craig J, Barrès R, Eynon N, Voisin S. **Epigenetics.** 2019 May 3. [IF2009: 4.584].
69. The importance of sperm epigenetics for conception and embryology. Saupstad M, Andersen E, Barrès R. *Ugeskr Laeger.* 2018 Aug 20;180(34). pii: V02180152. Danish.
70. Sperm epigenetics and influence of environmental factors. Donkin, I and Barrès R. **Molecular Metabolism.** 2018 Feb 27. [IF2016: 6.799].
71. The microbiota and epigenetic regulation of Th17/Treg cells : in search of a balanced immune system. Luo A, Leach ST, Barrès R, Hesson L, Grimm MC and Simar D. **Frontiers Immunology.** 2017 Apr 10;8:417. [IF2016: 6.429].
72. Raghuraman S, Donkin I, Versteijhe S, Barrès R and Simar D. The emerging role of epigenetics in inflammation and immunometabolism. **Trends in Endocrinology and Metabolism.** 2016 Nov;27(11):782-795. [IF2016: 10.893].
73. Donkin I, Barrès R, Pinborg A. Epigenetic influence on embryonic development. *Ugeskr Laeger.* 2016 Sep 12;178(37). pii: V02160132. Danish.
74. Barrès R and Zierath JR, The Role of Diet and Exercise on the Transgenerational Epigenetic Landscape in Type 2 Diabetes. *Nature Reviews Endocrinology.* 2016 Jun 17. doi: 10.1038/nrendo.2016.87. [IF2016: 18.318].
75. Rasmussen M, Zierath JR, Barrès R. Dynamic epigenetic responses to muscle contraction. **Drug Discovery Today.** 2014 Mar 12. [IF2014: 6.691].
76. Zierath JR, Barrès R. Research Highlights: Nutritional status affects the epigenomic profile of peripheral blood cells. **Epigenomics.** 2011 Jun;3(3):259-60. [IF2011: 2.375].
77. Barrès R and Zierath JR. DNA methylation in Metabolic Disorders. Review. **American Journal of Clinical Nutrition.** 2011 Feb 2. Review. [IF2011: 6.669].
78. Tanti JF, Gual P, Grémeaux T, Gonzalez T, Barrès R and Le Marchand-Brustel Y. Alteration in insulin action: role of IRS-1 serine phosphorylation in the retroregulation of insulin signalling. **Annals of Endocrinology (Paris).** 2004 Feb;65(1):43-8. Review.
79. Le Marchand-Brustel Y, Gual P, Grémeaux T, Gonzalez T, Barrès R and Tanti JF. Fatty acid-induced insulin resistance: role of insulin receptor substrate 1 serine phosphorylation in the retroregulation of insulin signalling. **Biochemical Society Transactions.** 2003 Dec;31(Pt 6):1152-6. Review. [IF2003: 2.759].

BOOK CHAPTERS

Twin and Family Studies of Epigenetics – Translational Epigenetics Series. Time trends in epigenetic signatures and population health risks. Thorkild Sørensen and Romain Barrès. **Elsevier / Academic Press.** 2021.

AWARDS

- 2018 Best Oral Presentation Award, ETW2018 Óbidos, Portugal.
- 2017 Helmholtz Young Investigator in Diabetes Award (HeIDI) for “outstanding scientific achievement in the field of diabetes”.
- 2009 Best Poster Award. Epigenetics 2009, Melbourne.
- 2002 Best Poster award. AFERO, Toulouse.

RESEARCH GRANTS

I have secured over €9.4 million in competitive funding from national and international grant agencies as Principal Investigator and €10.8 million as co-applicant. In Australia, I have secured AU\$400k as Chief Investigator (CIA) from the Australian Research Council and the Ramaciotti Foundation and AU\$1.2M as CIB from Cancer Council Australia and the NHMRC. In Denmark, I have received continuous competitive funding since 2010, both from philanthropic sources and from the national agency the Danish Council for Independent Research (success rate 11%).

- 2019 Bishop D., Hawley J., Hoffman N., Barrès R. (Partner Investigator). Uncovering novel transcriptional & nuclear proteomic responses to exercise. Australian Research Council Discovery Program (DP190103630). AU\$500,000 (€300,000).
- 2018 Barrès R., Nobrega M., Simpson S. – Novo Nordisk Foundation – Challenge Programme - Ancestral causes of obesity: Understanding epigenetic transmission by spermatozoa. DKK 60 million (€ 8M).
- 2018 Stallknecht B.M., [...] Barrès R. – Independent Research Fund Denmark. FitMum: Fitness for good health of mother and child. DKK 3.9 million. (€ 500k).
- 2017 Barrès R. – Danish Council for Independent Research, Project Grant. Functional role of exercise-activated muscle enhancers in health and disease. DKK 2.6 million. (€ 350k).
- 2016 Barrès R. – Novo Nordisk Foundation – Endocrinology Research - Role of dietary lipids and exercise in the control of epigenetic plasticity in sperm – DKK 1.5M. (€ 200k).
- 2015 Barrès R., Bækhed F., and Arumugam M. – EFSD/Novo Nordisk Programme for Diabetes Research in Europe - Role of the gut microbiome on the epigenome of intestinal cells after bariatric surgery - € 96k.
- 2015 Zierath J., Sassone-Corsi P., Hawley J., Barrès R., Treebak J. – Novo Nordisk Foundation – Challenge Programme - Epigenetic control and the circadian clock: Turning back time on diabetes pathogenesis. DKK 60M. (€ 8M).
- 2014 Fabre O., Barrès R. - Danish Diabetes Academy, Postdoctoral fellowship - The role of environmental factors on the epigenetic inheritance of metabolic traits. DKK 2.5M. (€ 340k).
- 2014 Williams K., Barrès R. - Danish Research Council, Postdoctoral fellowship - DKK 1.9M. (€ 250k).
- 2013 Barrès R. – Novo Nordisk Foundation – Endocrinology Research - Do we transmit our environmentally-determined attributes to our offspring? DKK 300k. (€ 40k).
- 2013 Barrès R. – EFSD Diabetes and Cancer Programme 2013 - The role of epigenetic modifications in longterm memory of irradiation in cancer survivors. € 100k.
- 2012 Hardeman E.C., Simar D, and Barrès R. – Cancer Council NSW - The role of epigenetic modifications in long-term memory of irradiation in cancer survivors. AU\$ 360k. (€ 220k).
- 2012 Barrès R. – Novo Nordisk Foundation – Endocrinology Research - Do we transmit our environmentally-determined attributes to our offspring? DKK 500k (€ 67k).
- 2011 Barrès R. – EFSD/Lilly Fellowship Programme 2011 - Title: The role of transient DNA hypomethylation on muscular adaptation. € 50k.
- 2011 Ward R. and Barrès R. – Cancer Australia. Role of dietary compounds on Non-CpG methylation in colorectal Cancer. AU\$ 295k. (€ 180k).
- 2010 Barrès R., Zierath J.R. and Gunning P.W. – Australian Research Council – Discovery Project 2011. The role of transient DNA hypomethylation on muscular adaptation. AU\$ 320k. (€ 200k).
- 2010 Barrès R. – Ramaciotti Foundation – Establishment Grant. The role of transient DNA hypomethylation on muscular adaptation. AU \$76k. (€ 50k).
- 2010 Morris M. and Barrès R. – National Health and Medical Research Council (Australia). How does paternal obesity influence offspring glucose tolerance? AU\$ 490k. (€ 300k).
- 2008 Barrès R., Zierath J.R. – Fredrik and Ingrid Thuring Foundation - Project funding. € 10k.

- 2007 Zierath J.R. and Barrès R. – European Foundation for the Study of Diabetes (EFSD) and Eli Lilly and Company European Diabetes Research Programme. € 100k.
- 2006 Barrès R. – Foundation for Medical Research (FRM). Postdoctoral fellowship. € 24k.
- 2001 Barrès R. – French Research Council. PhD funding € 40k.

INVITED CONFERENCE TALKS (past 5 years)

- 2021 Meeting of the AFERO 2021 (French Association for the Study of Obesity).
- 2020 Beyond Gene Conference (online).
- 2019 DOHaD Melbourne 2019, Melbourne, Australia.
Epigenetic Inheritance Zurich 2019, Zurich, Switzerland.
American Diabetes Association (ADA) Meeting, San Francisco, USA.
Non-coding RNAs in Metabolic Disease. Copenhagen, Denmark.
SFD 2019. Conference of the French Diabetes Society. Marseille, France.
French Physiological Society Meeting, Montpellier, France.
- 2018 European Testis Workshop (ETW) 2018. Óbidos, Portugal.
Rachmiel Levine-Arthur Riggs Diabetes Research Symposium 2018. Pasadena, USA.
American Diabetes Association (ADA) Meeting, Orlando, USA.
- 2017 American Diabetes Association (ADA) Symposium - Epigenetics and Epigenomics: Implications for Diabetes and Obesity. Cambridge, USA.
5th Helmholtz-Nature Medicine Diabetes Conference. HeIDI Nominee. Munich, Germany.
European Association for the Study of Diabetes conference. Lisbon, Portugal.
Swiss Society of Sport Science (SGS). Feb 2017, Zurich. Keynote speaker.
- 2016 3rd BBDC-Joslin-UCPH Conference 2016. Nov 2017, Boston.
Annual Meeting of the Finnish Endocrine Society. Nov 2016, Helsinki.
Symposium on bone, energy metabolism and diabetes. Oct 16, Odense, Denmark.
European Conference of Endocrinology 2016. May 2016, Munich.
Swedish Diabetes Summit Malmö. Apr 2016, Malmö.
West Coast Epigenetic Day 2016. Feb 2016. University of California Irvine, USA.
- 2015 The Physiological Society - Physiology 2015. Jul 2015, Cardiff, UK.
- 2014 Swiss society for the study of Diabetes (SSED) Annual Meeting 2014. Zurich, Switzerland.
SFD French Diabetes Society. Paris, France.

CONFERENCE PRESENTATIONS

- 2017 Barrès R. Exercise Metabolism - Cell Symposia. Short talk. Gothenburg, Sweden.
- 2014 Donkin I. and Barrès R. EASD annual meeting 2014. Vienna, Austria.
- 2014 Versteijhe S. and Barrès R. Keystone Symposium Epigenetics 2014. Boston, USA.
- 2011 Barrès R. Keystone Symposium Diabetes. Keystone, USA.
- 2003 Barrès R. ALFEDIAM (French Federation for the Study of Diabetes. Bordeaux, France.
- 2002 Barrès R. X Colloque des doctorants en Biologie-Santé. Toulouse, France.
- 2002 Barrès R. AFERO (French Alliance for Obesity Research). Toulouse, France.
- 2002 Barrès R. ALFEDIAM (French Federation for the Study of Diabetes). Strasbourg, France.
- 2001 Barrès R. Journée de l'IFR 50. Nice, France.

INVITED SEMINARS (selected)

- 2019 University of Chicago, Department of Human Genetics. Host: Prof. Nóbrega.
- 2017 Faculty of Medicine, Chiang Mai University, Thailand. Host: Anusorn Lungkaphin
- 2016 Mahidol University, Bangkok, Thailand. Host: Varanuj Chatsudthipong.
- 2016 INSERM Paris – Les Cordeliers Institute, France. Host: Nicolas Venteclef.
- 2016 Max Plank, Cologne, Germany. Host: Jan-Wilhelm Kornfeld.
- 2015 Institute of Cardiovascular and Metabolic Diseases, Toulouse. Host: Remy Burcelin.
- 2014 CNRS Lyon, France. Host: Rémi Mounier.
- 2014 Victoria University. Melbourne, Australia. Host: Nigel Stepto.
- 2014 Victor Chang Cardiac Research Institute. Sydney, Australia. Host: Catherine Suter.
- 2013 Institute for Research in Biomedicine (IRB), Barcelona, Spain. Host: Antonio Zorzano.
- 2013 Pasteur Institute, Lille, France. Host: Philippe Frogel.
- 2013 Cochin Institute, Paris, France. Host: Catherine Postic.

2011 Queensland Medical Research Institute, Brisbane, Australia. Host: Emma Whitelaw.

ORGANISATION OF SCIENTIFIC CONFERENCES

- 2019 Metabolism in Action – Metabolism in Action – Central and peripheral control of energy metabolism. Farvholm (Hillerød), Denmark. 190 participants. Co-organizer.
- 2018 Scientific Committee of the European Association for the Study of Diabetes (EASD) meeting – Berlin 2018.
- 2017 Metabolism in Action – Lifestyle influence of Genes and Environment. Hillerød, Denmark. 185 participants. Co-organizer.
- 2013 Genomics in Metabolism. Comwell Borupgaard, Denmark. 200 participants. Co-organizer.
- 2001 PhD Student's Symposium. Nice, France. 100 participants. Chair of the organising Committee.

INTERNATIONAL STANDING AND PROFESSIONAL CONTRIBUTIONS

- 2015- Part of the leadership team for an international programme (Challenge Programme) funded by the Novo Nordisk Foundation that has secured DKK60M for a collaborative research network across three continents.
- 2015-17 Coordinator of research alliances established by the Novo Nordisk Foundation Center for Basic Metabolic Research with Prof. Rando at University of Massachusetts Medical School (UMASS, USA).

OUTREACH – MEDIA and POPULAR SCIENTIFIC PRESENTATIONS

- 2017 Copenhagen Science Festival. Debate.
- 2016 Press articles in over 150 international media, such as *The New-York Times*, *The Guardian*, *The Telegraph*, *The Washington post*, *STAT*, *BBC news*, *Le Monde* and *El Mondo*.
- 2014 Copenhagen Science Festival. Debate.
- 2013 Article in Danish newspaper *Berlingske*.
- 2013 Lecture at Exhibition at the Medical Museum “The Substance of Fat”, Copenhagen, Denmark.
- 2012 Press articles in over 60 international media, such as *CBS News*, *The Times*, *Fox News*, *O’Globo (Brazil)*, *Huffington Post* and *New Scientist*.
- 2012 Publication mentioned in *BBC2* show “Dara Ó Briain’s Science Club - Sex and Genetics”.
- 2010 Interview for TV channel *Ten* Australia – Ten News.

EDITORIAL RESPONSIBILITIES

Associate Editor for Frontiers Endocrinology
<http://journal.frontiersin.org/journal/endocrinology>

REFERENCE FOR SCIENTIFIC JOURNALS

Cell Metabolism / Nature Medicine / Diabetes / Diabetologia / Clinical Epigenetics / Epigenetics / Scientific Reports / European Journal of Endocrinology / British Journal of Pharmacology / American Journal of Physiology – Endocrinology and Metabolism / American Journal of Hypertension / Clinical Chemistry and Laboratory Medicine / PLoS One.

REFERENCE FOR FUNDING AGENCIES

European Research Council (ERC) / NHMRC (Australia) / French ANR (National Agency for Research) / National Science Center (Poland) / French Federation for Diabetologia (FFD).

ASSESSMENT OF POSTGRADUATE THESES

- 2018 Chair of PhD Committee. Line Hjort. University of Copenhagen, Denmark.
- 2018 PhD opponent. Milana Kokosar. University of Gothenburg, Sweden.
- 2017 PhD reviewer. Jean-Philippe Perrier. University Paris-Saclay.
- 2017 Chair of PhD Committee. Malene Maag Kristensen. University of Copenhagen, Denmark.
- 2017 PhD assessor. Lise Hardy. University Pierre and Marie Curie, Paris, France.
- 2016 PhD opponent. Sarah Voisin. Uppsala Universitet, Sweden.

- 2016 PhD opponent. Maysa Nabulsi. University Pierre et Marie Curie, Paris, France.
 2015 Chair of PhD Committee. Elin Hall. Lund University, Sweden.

SUPERVISION OF PhD STUDENTS

At University of Copenhagen, Denmark

- 2018- Eleonora Manitta. Identification of epigenetic modifiers of the acute response to exercise.
 2015- Emil Andersen. Role of dietary factors in sperm-mediated epigenetic inheritance.
 2015-19 Lars Ingerslev. Bioinformatic analyses in epigenetic inheritance.
 2014-18 Mette Yde. The role of diet and insulin in the liver miROME.
 2012-17 Mie Mechta. The effect of nutrition on the epigenome.
 2012-15 Vibe Nylander. Implication of epigenetic factors in the metabolic complications of irradiation.
 2012-15 Ida Donkin. Do we transmit our environmentally-acquired attributes to our offspring?

At Karolinska Institutet, Sweden

- 2007-11 Jie Yan. PhD student. Co-supervision with Prof. Zierath.

SUPERVISION OF POSTDOCTORAL FELLOWS

- 2018- Lewin Small
 2018- Leonidas Lundell
 2017-20 Pattarawan Pattamaprapanont. currently a postdoctoral fellow at Harvard.
 2017- Ali Altintas
 2015-18 Rhianna Laker. currently working as a Research Scientist at AstraZeneca
 2014- Kristine Williams
 2016-16 Ida Donkin. Obstetrician and public debater on health policy and communication
 2014-16 Christian Garde. currently Bioinformatician at Evaxion Biotech A/S
 2014-17 Odile Fabre. Pharmacists and Project Leader, Groupe Ethique et Santé
 2014-16 Audrey Poupeau
 2013-14 Kui Qian
 2011-15 Morten Rasmussen, currently Senior Researcher at the Statens Serum Institute
 2011-14 Soetkin Versteijhe

SUPERVISION OF MASTER'S STUDENT

At University of Copenhagen, Denmark

- 2017-18 Galal Chehabi
 2017-18 Yasmin Dehestani. Medical Master's student.
 2017-18 Danial Ahwazi, Master's student.
 2016-17 Marte Saupstad, Medical Master's student.
 2014-15 Emil Andersen, Human Biology.
 2015-16 Noami Nadler, Medical Master's student.
 2014-15 Lykke Boysen, Veterinary Master.
 2013-14 Ida Donkin, Medical Master's student.
 2011-12 Vibe Charlotte Nylander, Human Biology.
 2011-12 Mie Mechta, Human Biology.
 2011-12 Fransisc Cantor, Master's student.

At INSERM, Nice, France

- 2004 Jabra Jahbri. Master's of Pharmacology, co-supervision with Jean-Francois Tanti.
 2003 Pierrick Dutto. Master's of Pharmacology, co-supervision with Jean-Francois Tanti.
 2002 Luc Brachot. Master's of Pharmacology, co-supervision with Jean-Francois Tanti.
 2002 Olivier Baillet. Master's of Pharmacology, co-supervision with Jean-Francois Tanti.

SUPERVISION OF BACHELOR STUDENT

At University of Copenhagen, Denmark

- 2017-18 Mikkil Julin, Medical Bachelor student.
 2017-18 Brendan Deeney, Bachelor student.

At University of New South Wales

- 2010-11 David Hu. Honours in Medical Science.
Nur Arifin. Honours in Medical Science.
- 2010-11 Ulrika Andersson. Bachelor in Medical Science.
Ingrid Paul. Bachelor in Medical Science.