Inserm
Délégation régionale
Midi-Pyrénées, Limousin

Equipe 3

Gilles Dietrich
Interactions neuro-immunes intestinales

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Objectif scientifique

L'inflammation intestinale se traduit souvent par une hypersensibilité viscérale et une hypercontractilité intestinale elle-même responsable d'une hyperglycémie chronique. Nous sommes un groupe de recherche en neuro-immunologie appliquée à la neuro-gastro-entérologie. Notre activité se concentre essentiellement à l'étude de mécanismes de régulation de la douleur viscérale d'origine inflammatoire et de l'axe intestin-cerveau et de sa pertinence dans la régulation des fonctions digestives.
Notre recherche vise à:
- Identifier des composés lipidiques produits par la flore intestinale et impliqués dans la régulation de la douleur et de l'inflammation intestinale
- Mieux comprendre les mécanismes de régulation endogène de la douleur et de l'inflammation intestinale par les opioïdes d?origine lymphocytaire
- Mieux comprendre les effets des médiateurs inflammatoires sur l'activité du système nerveux entérique et leurs conséquences sur le métabolisme glucidique

Retombées attendues en santé

Développement de nouvelles molécules bioactives et/ou de stratégies thérapeutiques à visée anti-inflammatoire, antalgique et/ou métabolique pour le traitement des maladies inflammatoires de l'intestin, du syndrome du côlon irritable et/ou du diabète.

Mots clés

Douleur viscérale / Réponse immunitaire / Système nerveux entérique intrinsèque et extrinsèque / Métabolites du microbiote / Métabolisme glucidique

Formation à la recherche

Master 2 "Santé Digestive & Nutrition" Toulouse
Master 2 "Immunologie et Maladies Infectieuses" Toulouse
Master 2 "Innovation pharmacologique" Toulouse
Master 1 "Innovations technologiques en santé digestive" Toulouse

Coopérations / Partenariats

Pr Jean Lesage (USTL, Lille)
Drs Claude Boucheix & Céline Gréco (UMR-S935, Université Paris Saclay, Villejuif)
Dr. Gaveriaux-Ruff (Institut de Génétique et de Biologie Moléculaire et Cellulaire, Illkirch)
Pr Patrice D. Cani (UCL, Brussels, Belgium) ? European Associated Laboratory (EAL) ?NeuroMicrobiota? (UCL/INSERM)
Dr Marc Claret (IDIBAPS, Barcelona, Spain)
Pr Oliver Soehnlein (Institute for Cardiovascular Prevention, LMU Munich, Germany)
Dr David Bulmer, (London School of Medicine, London, UK)
Dr Ewan St. John Smith (University of Cambridge, UK)

Principales publications du laboratoire

Drougard A, et al. 2017. Central chronic apelin infusion decreases energy expenditure and thermogenesis in mice. Sci Rep. in press.
Fournel A, et al. 2017. Apelin targets gut contraction to control glucose metabolism via the brain. Gut. 66(2):258-269.
Basso L., et al. 2016. Endogenous analgesia mediated by CD4+ T lymphocytes is dependent on enkephalins in mice. J. Neuro. Inflamm. 13:132.
Cani PD, Knauf C. 2016. How gut microbes talk to organs: The role of endocrine and nervous routes. Mol Metab. 5(9):743-752.
Cenac, N., et al. 2016. A novel orally administered trimebutine compound (GIC-1001) is anti-nociceptive and features peripheral opioid agonistic activity and Hydrogen Sulphide-releasing capacity in mice. European journal of pain (London, England) 20:723-730.
Henry, C.O., et al. 2016. In vitro and in vivo evidence for an inflammatory role of the calcium channel TRPV4 in lung epithelium: Potential involvement in cystic fibrosis. American journal of physiology 311:L664-675.
Viola, J.R., et al. 2016. Resolving Lipid Mediators Maresin 1 and Resolvin D2 Prevent Atheroprogression in Mice. Circulation research 119:1030-1038.
Basso L., et al. 2015. Intestinal inflammation and pain management. Curr. Opin. Pharmacol. 25:50-55.
Cenac, N., et al. 2015. Quantification and Potential Functions of Endogenous Agonists of Transient Receptor Potential Channels in Patients With Irritable Bowel Syndrome. Gastroenterology 149:433-444 e437.
Boue J., et al. 2014. Endogenous regulation of visceral pain via opioid production by colitogenic CD4+ T lymphocytes in mice. Gastroenterology. 146: 166-175.

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Team 3

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Intestinal neuro-immune interactions

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Scientific objective

Intestinal inflammation often results in both visceral hypersensitivity and intestinal hypercontractility which, in turn, participates to chronic hyperglycemia. We are a group of neuro-immunology dedicated to the neuro-gastroenterology with a special focus on intestinal inflammation, visceral pain and the gut-brain axis and its relevance in the regulation of digestive functions.
Our research aims at:
- Identifying microbiota-derived lipid compounds involved in the regulation of intestinal inflammation and pain
- Deciphering the mechanisms of the endogenous regulation of inflammation and visceral pain by T cell-derived opioids
- Analyzing the effects of inflammation-related mediators on enteric nervous system activity and their consequences on metabolism

Expected health effects

Development of new pharmacological bioactive molecules and therapeutic strategies to improve intestinal inflammation, visceral pain and chronic hyperglycemia associated with Inflammatory Bowel Diseases, Irritable Bowel Syndrome and/or Diabetes.

Key words

Visceral pain / Immune response / Intrinsic and Extrinsic Enteric Nervous / Microbiota-derived metabolites / Glucose Metabolism

Research training

Master 2 "Digestive Health & Nutrition", Toulouse
Master 2 "Immunology and Infectious Diseases", Toulouse
Master 2 "Pharmacology", Toulouse
Master 1 "Technological innovation in digestive health", Toulouse

Cooperation and Partnerships

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