Inserm
La science pour la santé
From science to health

Institute of Psychiatry and Neuroscience of Paris
Institut de Psychiatrie et Neurosciences de Paris

Université Paris Cité

Biochemistry and Biophysics (B&B) facility
(Institute of Psychiatry and Neuroscience of Paris)

Erwan Boëdec
Tél : 01 40 78 92 25
E-mail : erwan.boedec@inserm.fr

Inserm
La science pour la santé
From science to health

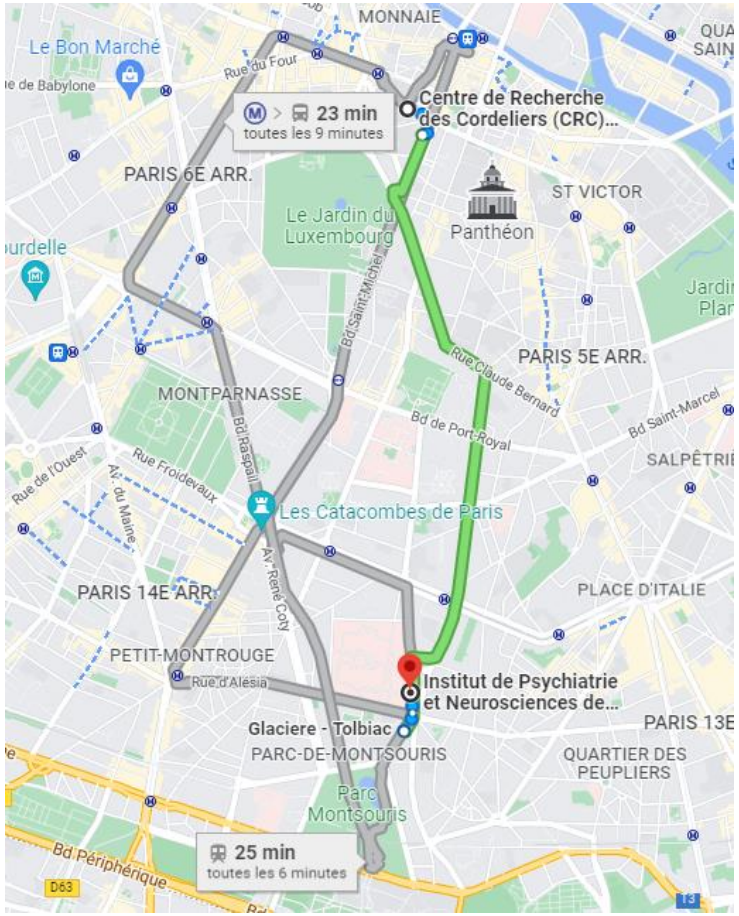
Institute of Psychiatry and Neuroscience of Paris
Institut de Psychiatrie et Neurosciences de Paris

Université Paris Cité

B&B – Overview and services

Institute of Psychiatry and Neuroscience of Paris (IPNP)

The Institute of Psychiatry and Neuroscience of Paris is a multi-disciplinary community of over 150 basic and clinical neuroscientists, as well as faculty members working on: Neurodevelopment and Psychiatry, Behavior, Memory and Emotions, Neurovascular system, Multiscale imaging (from molecules to whole brain), Translational Neurosciences and molecular and cellular mechanisms in Aging Brain.



The B&B team

David Tareste
Scientific director

Inserm
La science pour la santé
From science to health

Kristina Niort
Engineer

Erwan Boëdec
Technical director

Inserm
La science pour la santé
From science to health

Nadège D'araujo
Financial manager

Inserm
La science pour la santé
From science to health

Equipments

- Training
- Technical support
- Maintenance
- Upgrading

Services

- Molecular biology
- Biochemistry
- Biophysics

Consulting

- Project design
- Monitoring

Services

The B&B facility is dedicated to the production, functionalization and analysis of recombinant proteins, the characterization of protein-protein and protein-lipid interactions, as well as the production of nucleic acids (DNA vectors, mRNA). Its several equipment are available for booking. B&B also helps you in the design and follow-up of your scientific projects.

- Plasmid construction
- Mutagenesis
- mRNA production

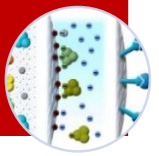
Molecular biology

- Bacteria
- Mammalian cells
- *In vitro* expression

Expression in various systems

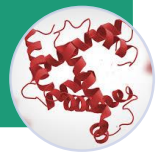
- Soluble proteins
- Membrane proteins
- Antibodies, nanobodies
- Adding fluorescent tags

Purification and functionalization



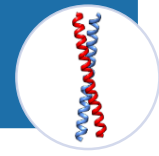
- Electrophoresis
- Chromatography
- Dynamic light scattering
- Proteomics *(outsourced)*

Identification (oligomerization, size, sequence)



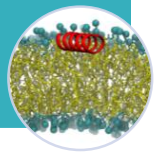
- FRET
- Dynamic light scattering
- Circular dichroism

Protein-protein interactions



- Liposome co-floatation
- Monolayer adsorption
- Spectral shift

Protein-lipid interactions



Equipment

Molecular biology
- Thermocycleur
- E-BOX
- Biophotometer

Biophotometer


Thermocycleur

Prokaryotes and eukaryotes culture
- Biosafety cabinet
- Ovens
- Shaking incubators


Infors

Cell disruption
- Emulsiflex-C3 homogenizer
- Tip sonicator


Emulsiflex-C3

Protein purification
- ÄKTA Pure 25M system
- lyophilizer : PowerDry LL 1500


ÄKTA Pure 25M

Protein analysis
- BioDrop
- ChemiDoc
- LI-COR
- Trans-blot turbo transfert


ChemiDoc

Equipment

Centrifugation (Beckman)

- 2 floor ultracentrifuges: Optima XPN-80 and L8-70M
- 1 tabletop ultracentrifuge: Optima MAX-XP
- 1 high performance centrifuge: Avanti JE
- 12 rotors

Optima XPN-80

Molecular interactions

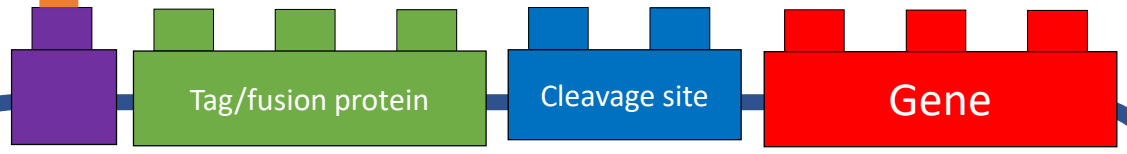
- 2 plate readers: Mithras LB 940, Berthold and EnVision, Perkin Elmer
- Langmuir-Blodgett trough: Microtrough XL, Kibron
- Dynamic light scattering (DLS): Zetasizer Ultra, Malvern
- Dichroïsme Circulaire : J-1500-150ST, JASCO

Zetasizer

Dichroïsme circulaire

Services (Molecular biology)

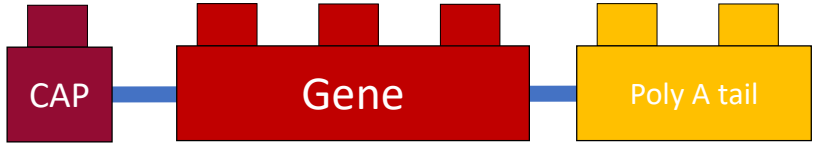
Plasmid Production



Add or deletion of items

- Tag
- Promoter
- Site directed mutagenesis
- Part of gene

ARNm Production



Option

- ARCA capped
- Modified nucleotide

Services (Protein production)

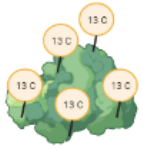
1 Choose your plasmid

1a Choose your Tag

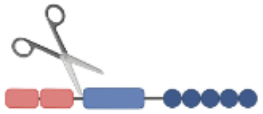
His | MBP | GST | Flag | mCHERRY | GFP

1b Choose your modification

Mutagenesis



13C labeling



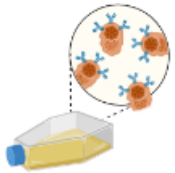
Cleavage site

2 Choose your host

Mammalian cell

Bacteria

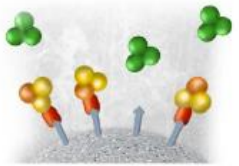
In Vitro



Hybridoma

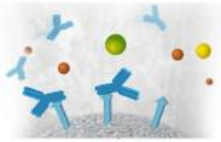
3 Choose your purification method

Size exclusion



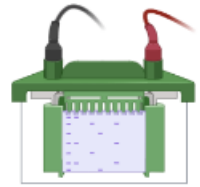
Affinity

Ion exchange



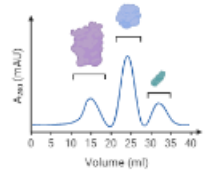
Antibodies purification

4 Choose your characterization control



Electrophoresis

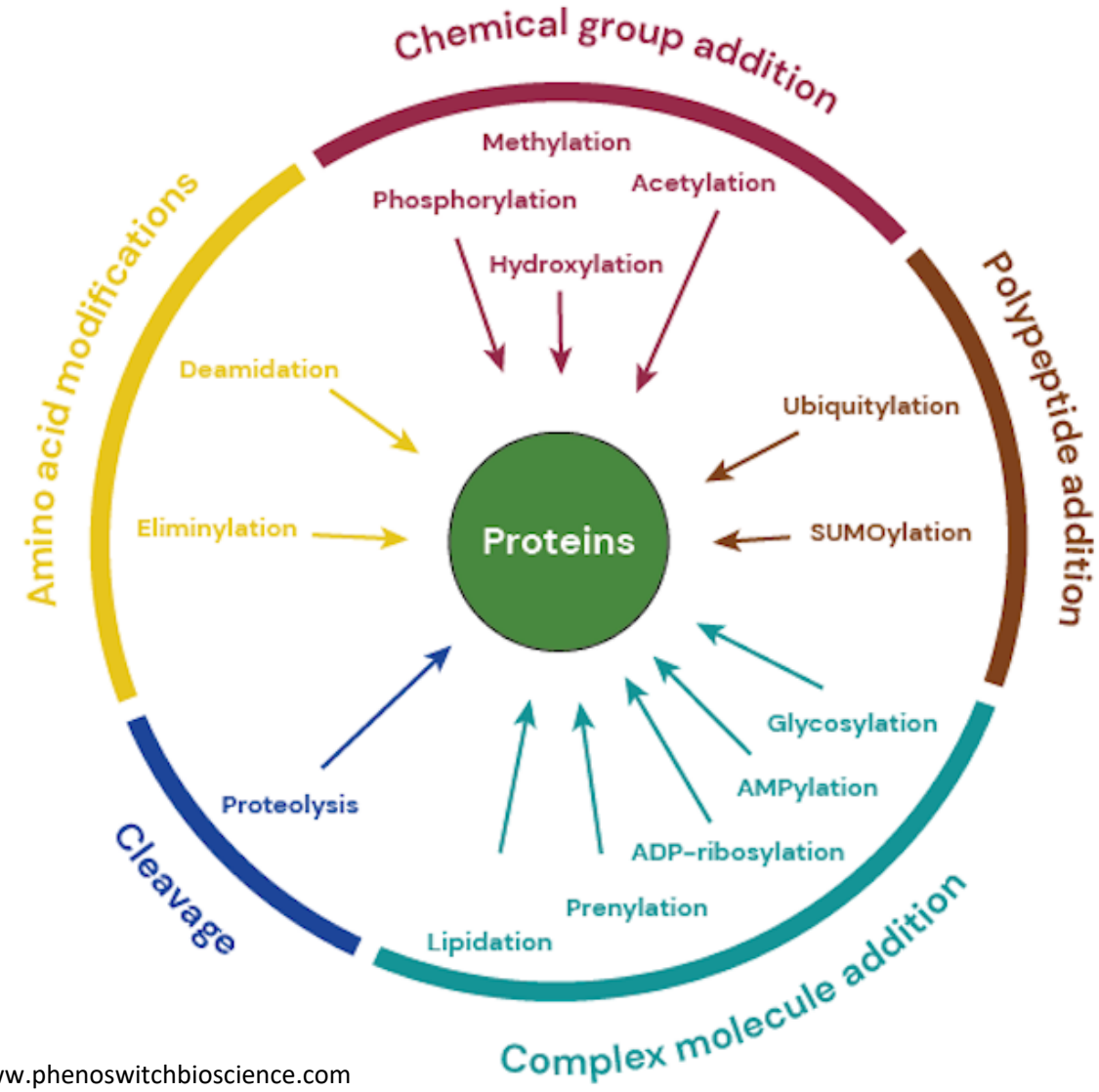
Light scattering



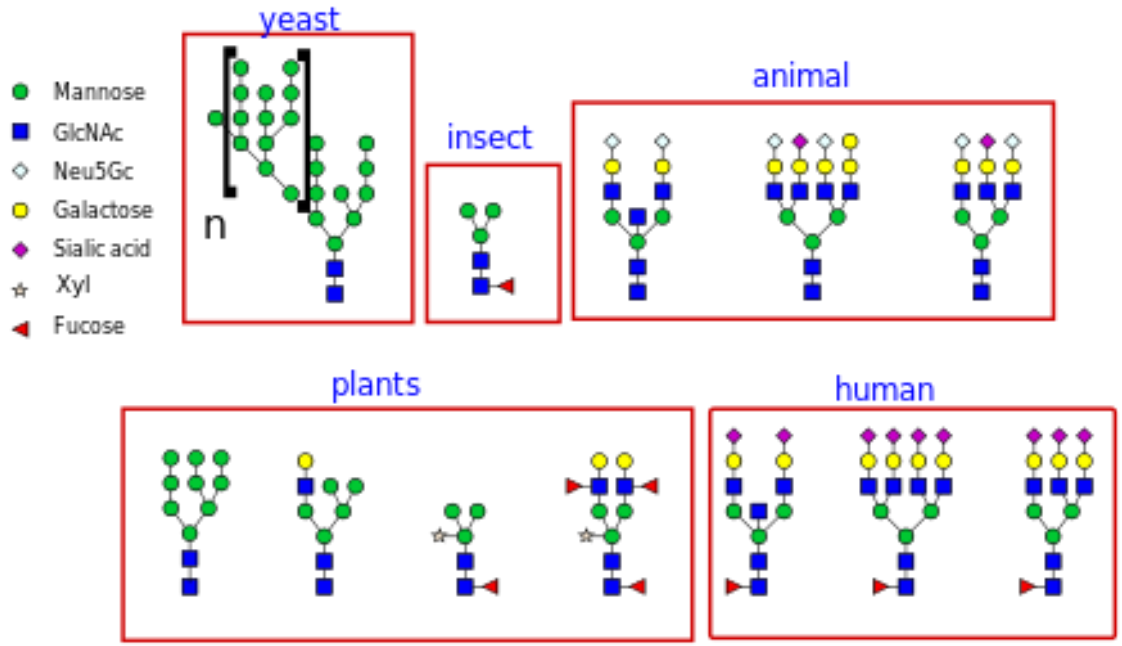
Chromatography

Proteomics (outsourced)

Post-translational modification



Glycosylations

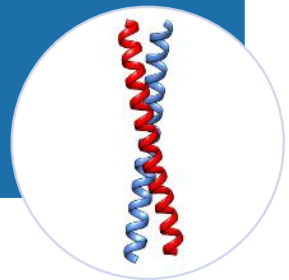


https://www.phenoswitchbioscience.com

Services (Molecular interactions)

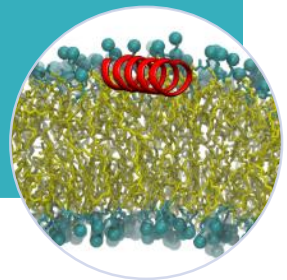
- Fluorescence resonance energy transfer
- Multi-angle dynamic light scattering
- Circular dichroism *(coming soon)*

Protein-protein interactions



- Liposome co-floatation
- Monolayer adsorption
- Spectral shift

Protein-lipid interactions



Inserm
La science pour la santé
From science to health

Institute of Psychiatry and Neuroscience of Paris
Institut de Psychiatrie et Neurosciences de Paris

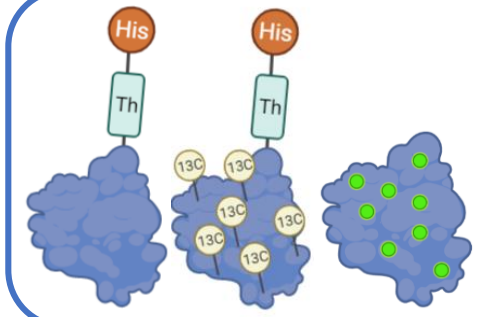
Université Paris Cité

B&B – Examples of current scientific projects and collaborations

Examples of current scientific projects and collaborations

- **Production of different services since 2016**
  - ✓ CRC team Kroemer

- 20 plasmids



- 15 recombinant proteins
- 1 recombinant protein 13C labeled
- 1 recombinant protein biotin labeled

Please cite this article in press as: Bravo-San Pedro et al., Acyl-CoA-Binding Protein Is a Lipogenic Factor that Triggers Food Intake and Obesitv. Cell Metabolism (2019), https://doi.org/10.1016/j.cmet.2019.07.010

Cell Metabolism

Article

Acyl-CoA-Binding Protein Is a Lipogenic Factor that Triggers Food Intake and Obesit

José M. Bravo-San Pedro,[1,2,3,27] Valentina Sica,[1,2,3,27] Isabelle Martins,[1,2,3] Jonathan Pol,[1,2,3] Frie Maria Chiara Maiuri,[1,2,3] Sylvère Durand,[1,2,3] Noélie Bossut,[1,2,3] Fanny Aprahamian,[1,2,3] Gerasimos Anagnostopoulos,[1,2,3,4] Mireia Niso-Santano,[5] Fernando Aranda,[6] Ignacio Ramírez-Pa Justine Lallement,[8] Jessica Denom,[8] Erwan Boedec,[9,10,11] Philip Gorwood,[12,13] Nicolas Ramoz,[13]

ARTICLE Open Access

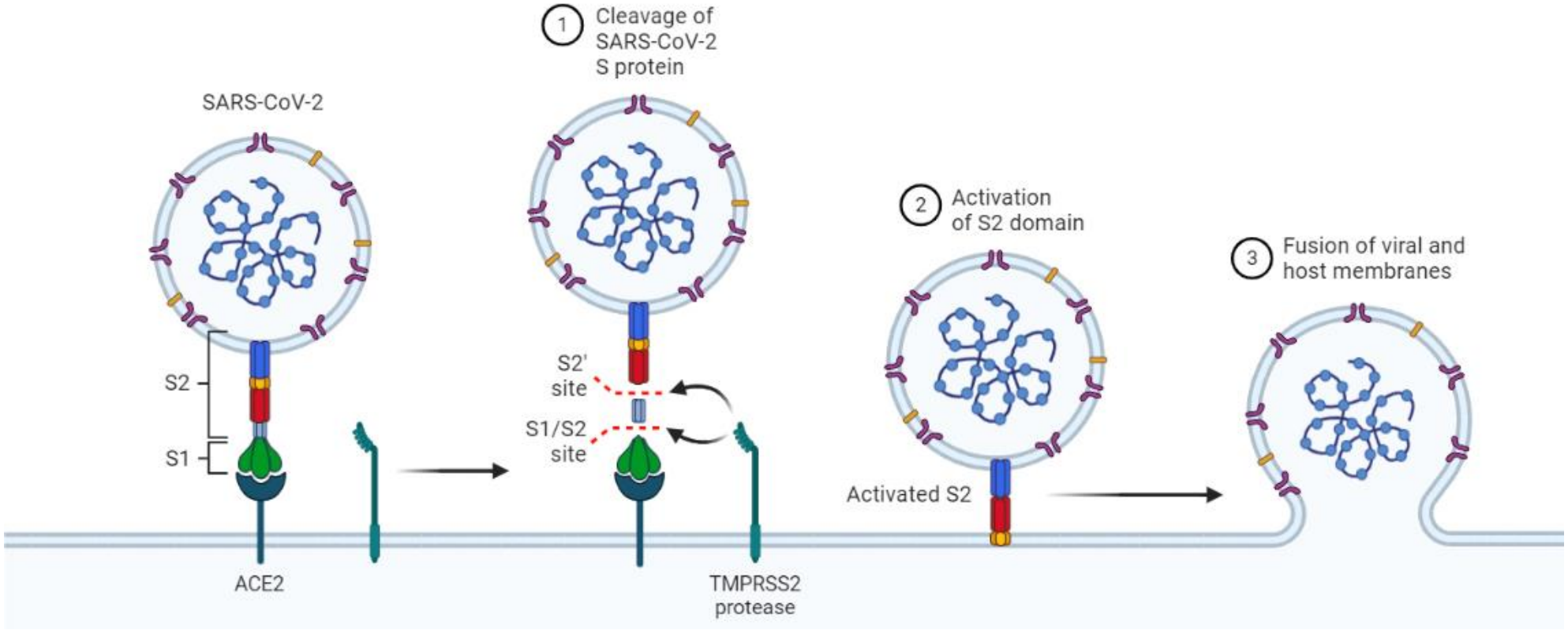
Metabolic and psychiatric effects of acyl coenzyme A binding protein (ACBP)/diazepam binding inhibitor (DBI)

Adrien Joseph[1,2,3], Stéphanie Moriceau[4], Valentina Sica[1,2,5], Gerasimos Anagnostopoulos[1,2,3], Jonathan Pol[1,2], Isabelle Martins[1,2,6], Antoine Lafarge[1,2,3], Maria Chiara Maiuri[1,2], Marion Leboyer[7,8,9,10], Josephine Loftus[7,11], Frank Bellivier[7,12], Raoul Belzeaux[7,13,14], Fabrice Berna[7,15], Bruno Etain[7,12], Delphine Capdevielle[7,16], Philippe Courtet[7,17,18], Caroline Dubertret[7,19], Julien Dubreucq[7,20], D'. Amato Thierry[7,21], Guillaume Fond[7,22,23], Sebastien Gard[7,24], Pierre-Michel Llorca[7,25], Jasmina Mallet[7,19], David Misdrahi[7,24], Emilie Olié[7,17], Christine Passerieux[7,26], Mircea Polosan[7,27], Paul Roux[7,26], Ludovic Samalin[7,25], Franck Schürhoff[7,8,9,10], Raymond Schwan[1,28], the FACE-SZ and FACE-BD (FondaMental Academic Centers of Expertise, for Schizophrenia and for Bipolar Disorder) Groups, Christophe Magnan[29], Franck Oury[4], José M. Bravo-San Pedro[30] and Guido Kroemer[1,2,31,32,33]

- 2 publications
- 1 in co-authors

Examples of current scientific projects and collaborations

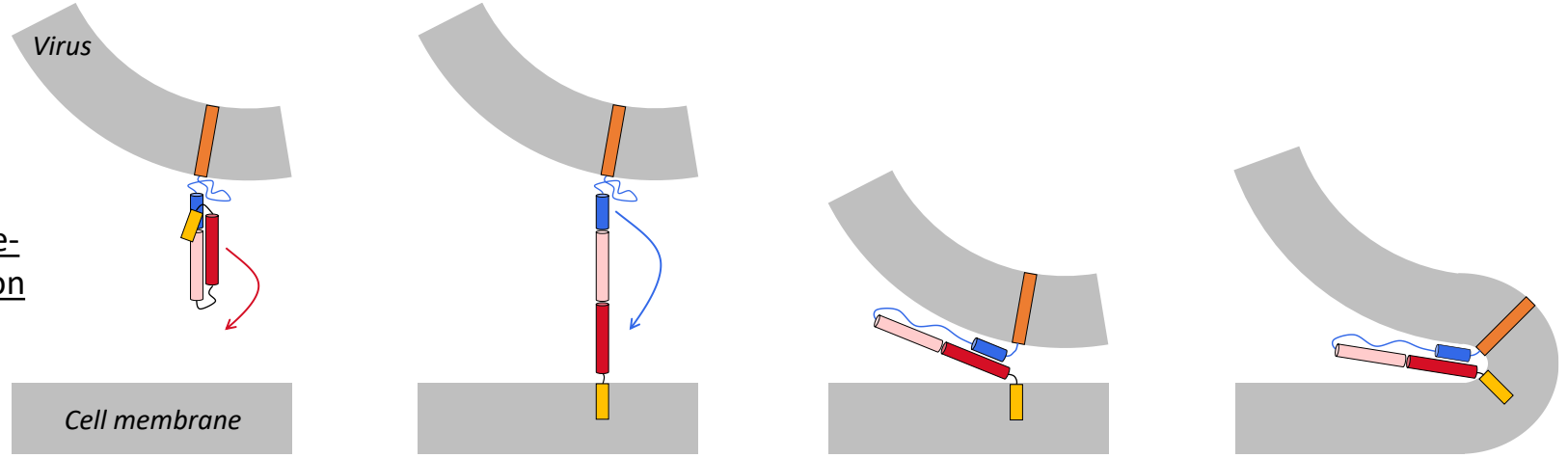
- **Repurposing approved drugs for the inhibition of fusion peptide-mediated SARS-CoV-2 entry**
  - ✓ IPNP team Galli
  - ✓ Gregory Lavieu INSERM laboratoire MSC/UMR 7057



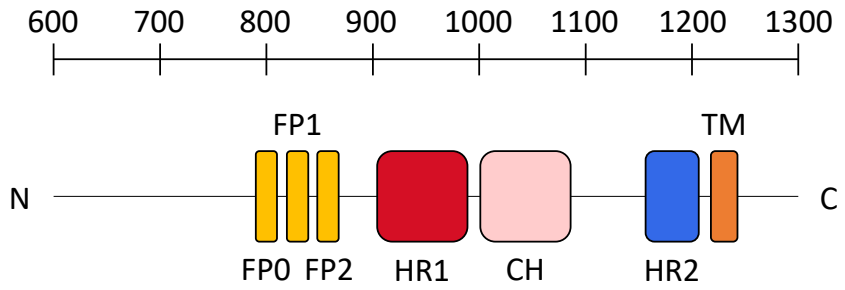
Examples of current scientific projects and collaborations

- **Repurposing approved drugs for the inhibition of fusion peptide-mediated SARS-CoV-2 entry**
  - ✓ IPNP team Galli
  - ✓ Gregory Lavieu INSERM laboratoire MSC/UMR 7057

Fusion peptide-mediated fusion



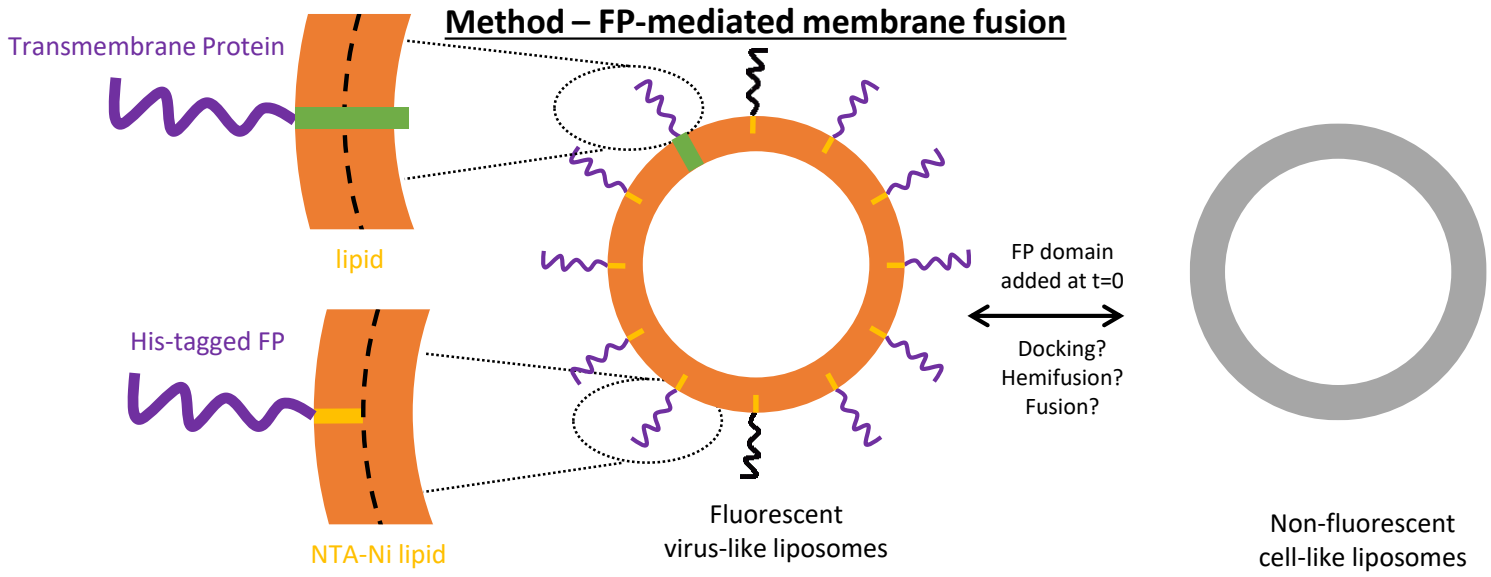
S2 subunit of the Spike protein

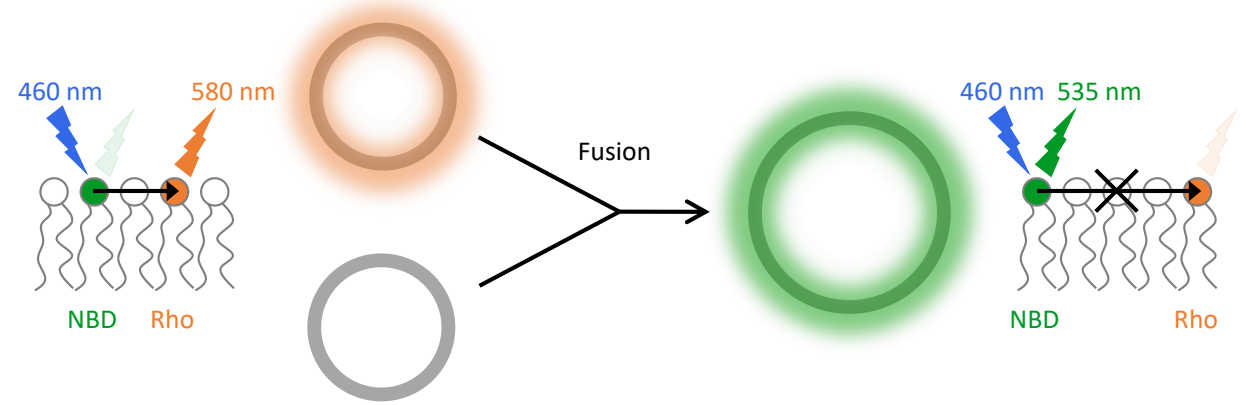


Examples of current scientific projects and collaborations

- Spike WT (S1-S2-TM-Cyto)
- Spike S2 (S2-TM-Cyto)

- Soluble Spike WT (S1-S2-His)
- Soluble Spike S2 (S2-His)





Examples of current scientific projects and collaborations

- **Replication of a recombinant protein already produced**
  - ✓ CRI team Monteiro
  - ✓ IPNP team Krebs

Contents lists available at ScienceDirect

Journal of Autoimmunity

journal homepage: www.elsevier.com/locate/jautimm

Autoantibodies against podocytic UCHL1 are associated with idiopathic nephrotic syndrome relapses and induce proteinuria in mice

Agnès Jamin [a, b, c, d], Laureline Berthelot [a, b, c, d, 1], Anne Couderc [d, e], Jonathan M. Chemouny [d, f], Erwan Boedec [a, b, c, d], Laurène Dehoux [d, e], Lilia Abbad [a, b, c, d], Claire Dossier [d, e], Eric Daugas [d, f], Renato C. Monteiro [a, b, c, d], Georges Deschênes [d, e, *]

	mg	€	€/mg	€ pour 36 mg
Industrie	1	1 200	1 200	43 200
Facility	36	1 750	48,61	1 750

*24

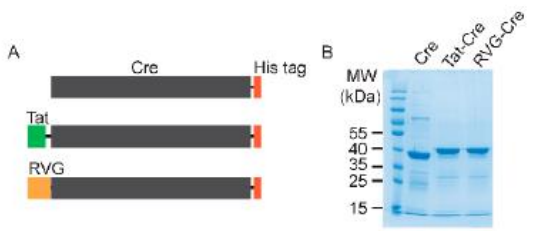
International Journal of *Molecular Sciences*

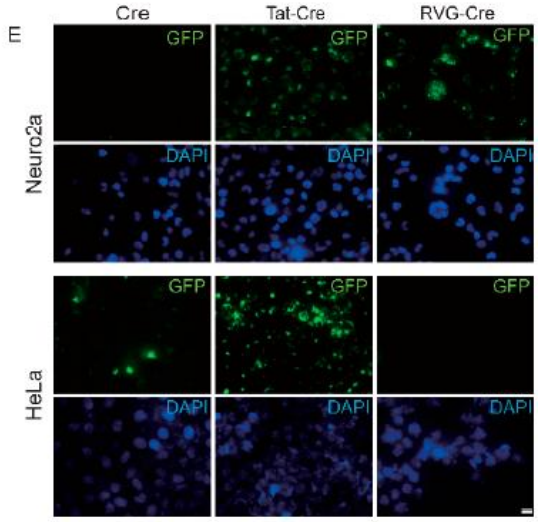
MDPI

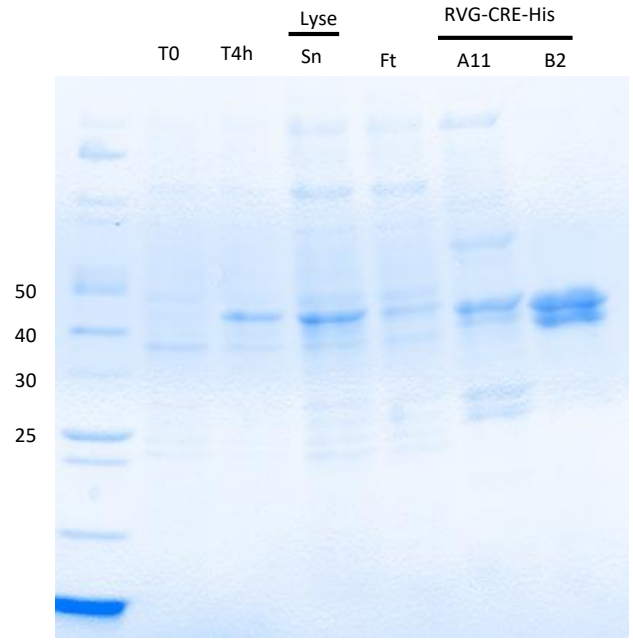
Communication

Cre Fused with RVG Peptide Mediates Targeted Genome Editing in Mouse Brain Cells In Vivo

[1,†], Pan Li [1,†], Tao Feng [1] and Sen Wu [1,*]







Examples of current scientific projects and collaborations

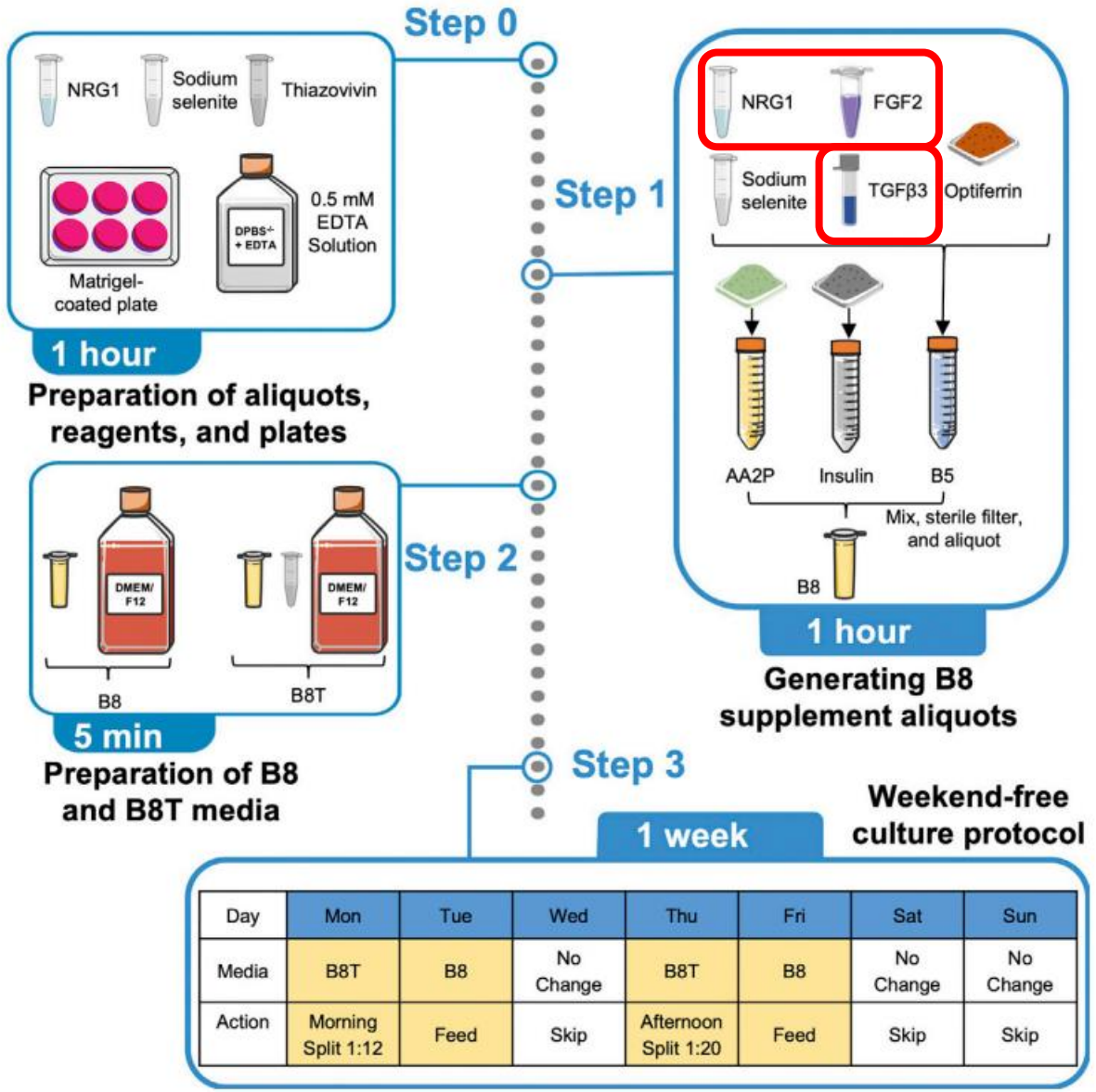
- **Production of recombinant protein in IPS culture**
  - ✓ IMAGINE team Kabashi

STAR Protocols

CellPress OPEN ACCESS

Protocol

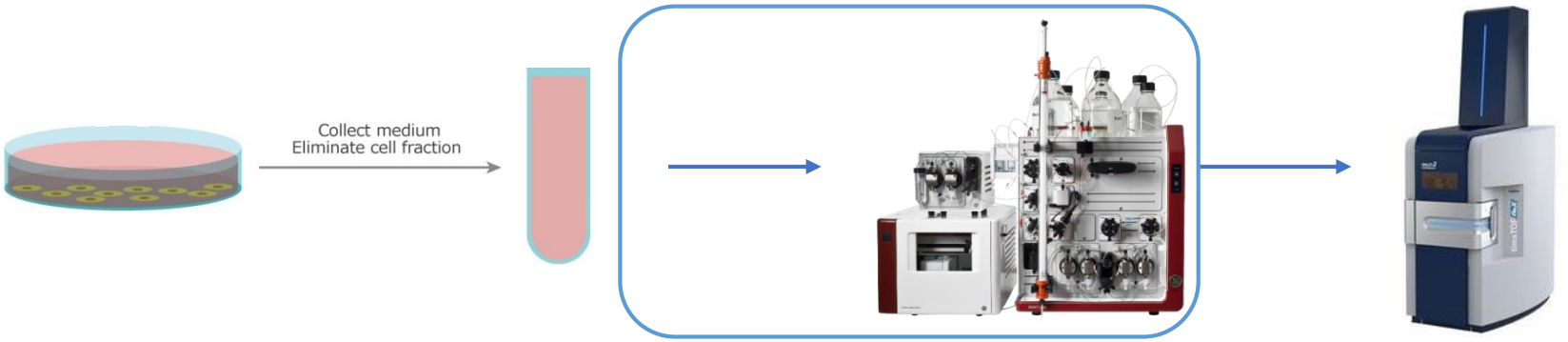
An updated protocol for the cost-effective and weekend-free culture of human induced pluripotent stem cells



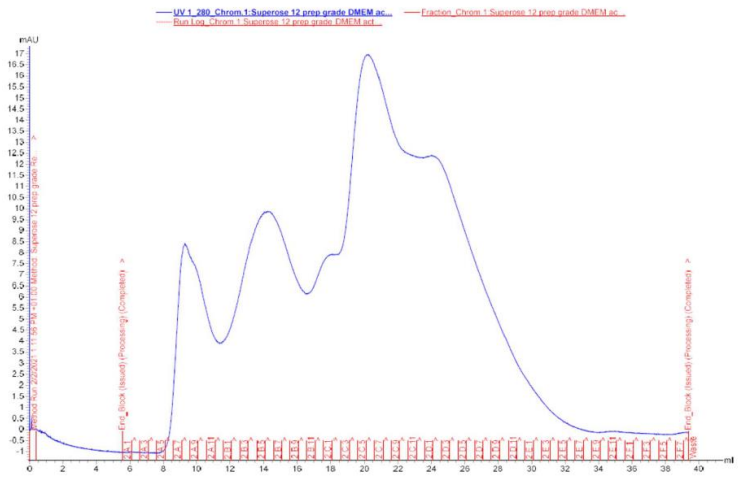
Day	Mon	Tue	Wed	Thu	Fri	Sat	Sun
Media	B8T	B8	No Change	B8T	B8	No Change	No Change
Action	Morning Split 1:12	Feed	Skip	Afternoon Split 1:20	Feed	Skip	Skip

Examples of current scientific projects and collaborations

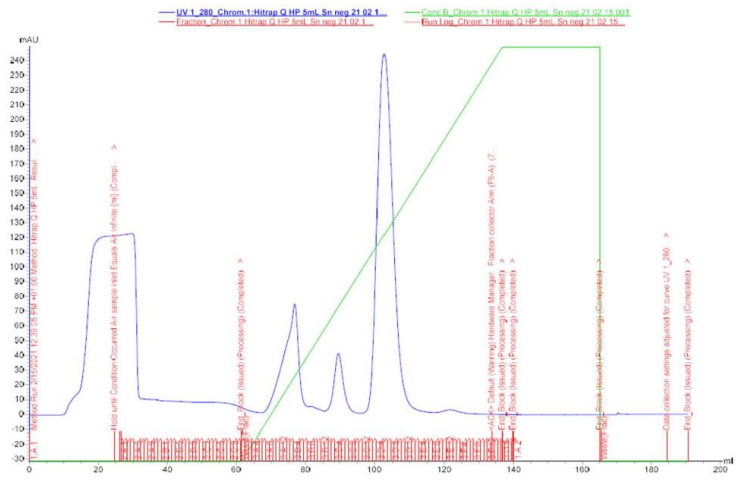
- **Isolation of a new effector from cell culture supernatant**
  - ✓ INEM Team Coureuil



Size exclusion column

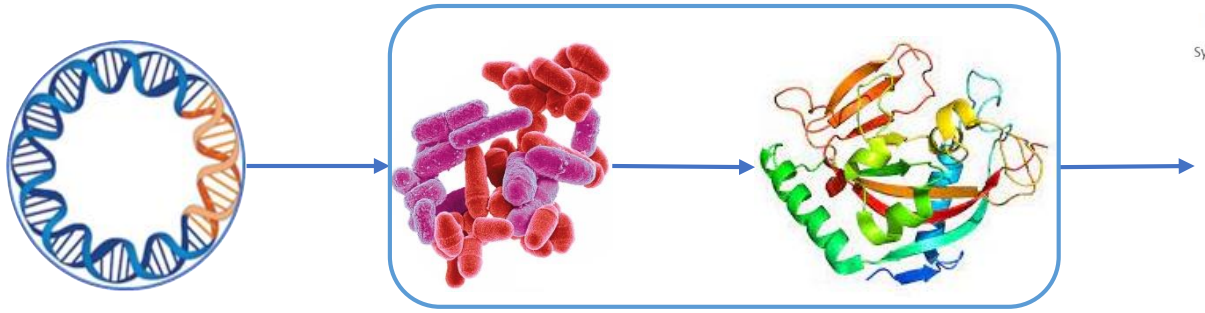


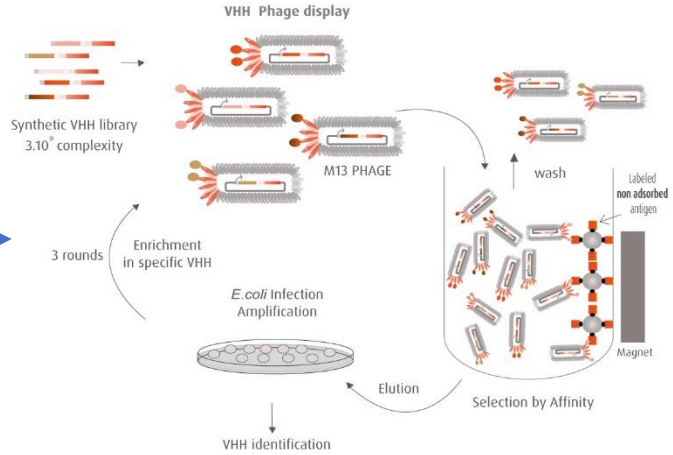
Ion exchange column



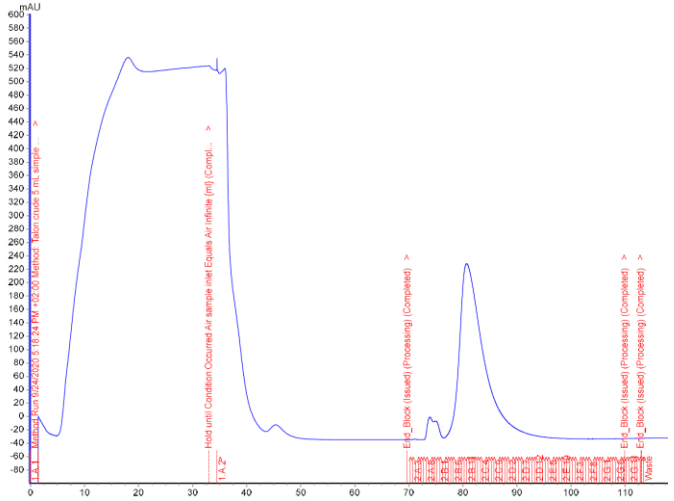
Examples of current scientific projects and collaborations

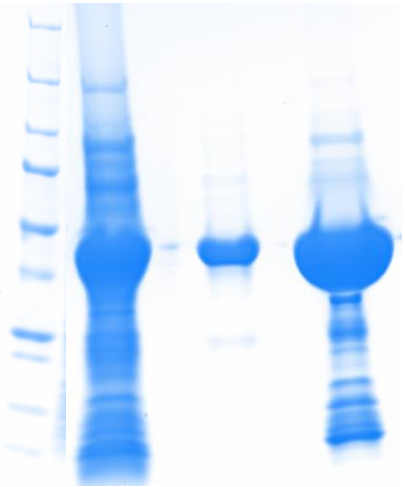
- **Production of a protein for nanobody's screening**
  - ✓ IPNP team Lenkei





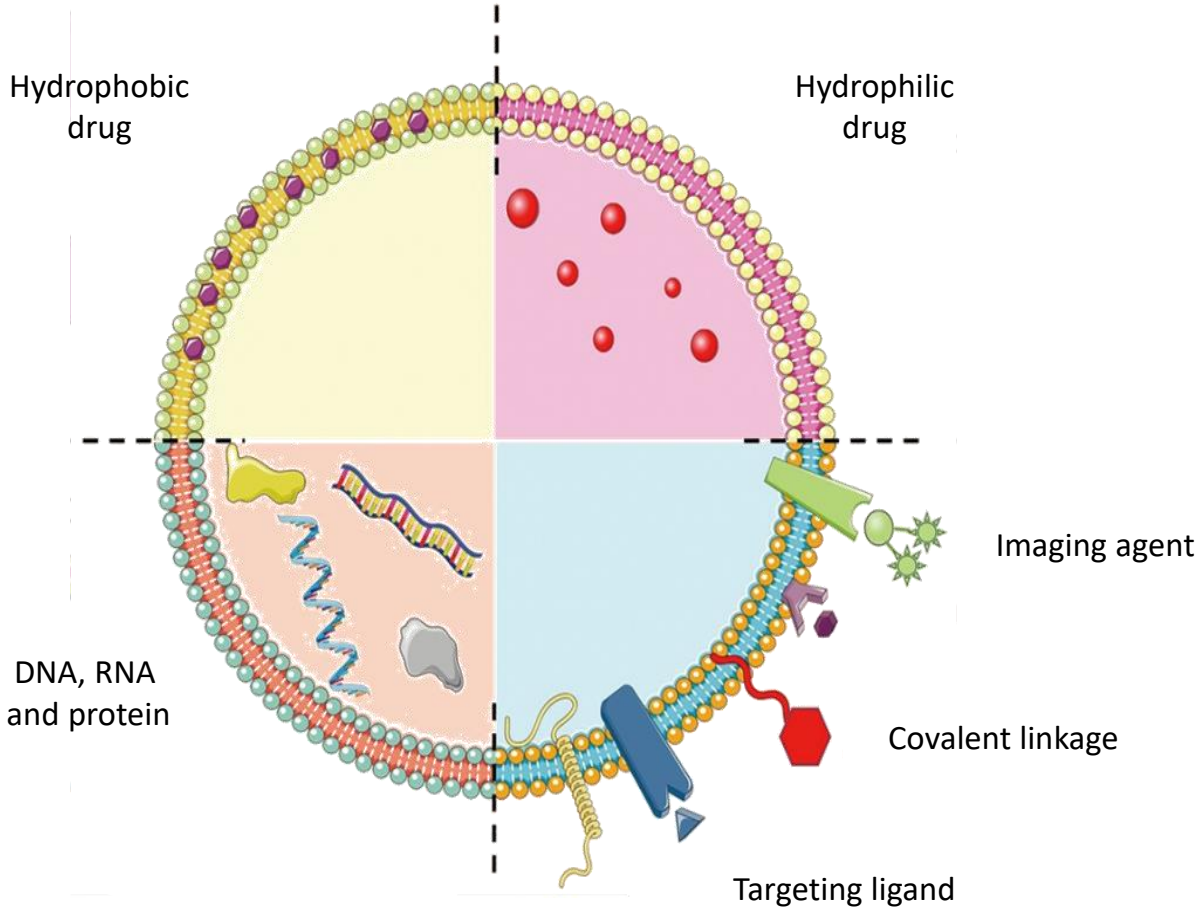
IMAC column





Examples of current scientific projects and collaborations

- **Engineering hybrid extracellular vesicles by fusion with liposomes**
  - ✓ IPNP team Galli
  - ✓ Florence Gazeau and Amanda Brun, Labo Matière et Systèmes Complexes, Paris 7



Main collaborations

IPNP :

- Team Galli
- Team Hanus
- Team Joutel
- Team Krebs
- Team Lenkei
- Team Rebholz
- Team van Niel

IVETh Project :

- Pole of technological expertise in the Production, Engineering and Characterisation of Extracellular Vesicles for Personalised Therapies.

Trousseau :

- Team Allergy & Environment

Imagine :

- Team Ménasché – Sepulveda
- Team Kabashi

CoRaKid :

- Team Mechanisms of acute kidney injury and repair

IFM :

- Team Groszer

Université de Montréal :

- CHU Sainte Justine

Companies :

- Darwin microfluidics
- Elvesys
- Onco-helios therapeutix
- Synthelis

CRC :

- Team Kroemer

CRI :

- Team Monteiro
- Team Charles - Blank

iNEM :

- Team Charbit – Nassif
- Team Schnupf

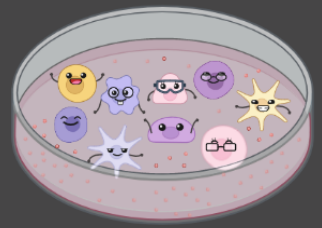
IPS2 :

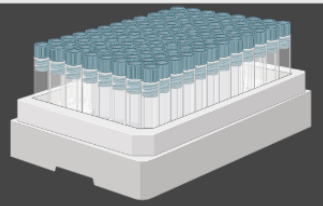
- Team Symbiosis and Immunity

EA2496

- Team Chaussain

Don’t hesitate to challenge us!!





Inserm
La science pour la santé
From science to health

Institute of Psychiatry and Neuroscience of Paris
Institut de Psychiatrie et Neurosciences de Paris

Université Paris Cité

Thank you for your attention

ipnp