Biopuce, 22 Janvier 2026

Apports de la transcriptomique à l'échelle de la cellule unique pour comprendre la maturation de l'épithélium intestinal

Martin Beaumont
GenPhySE, Toulouse

RÉPUBLIQUE FRANÇAISE
Liberté Égalité Fraternité

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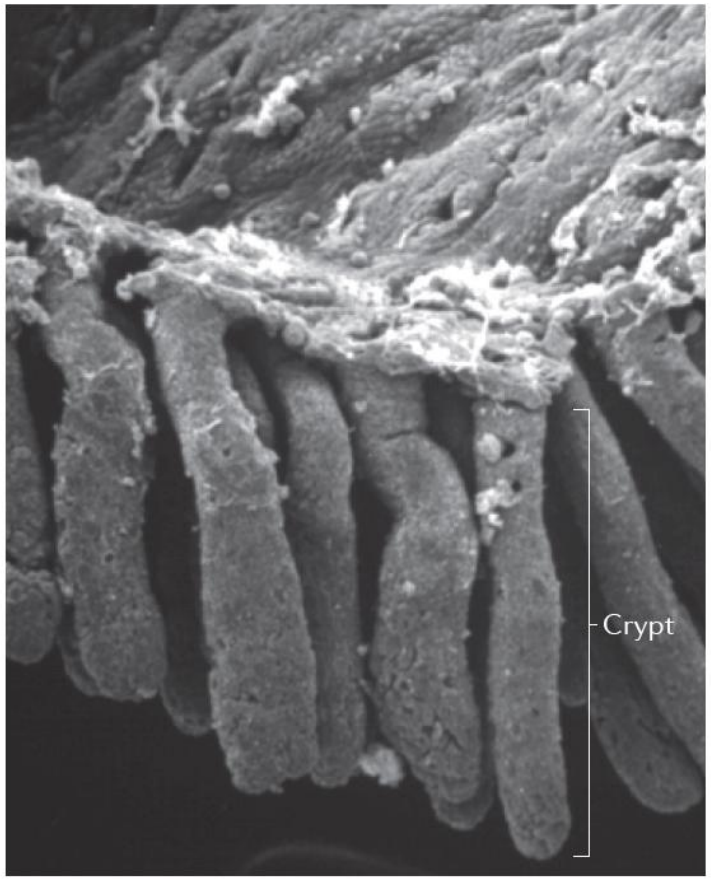
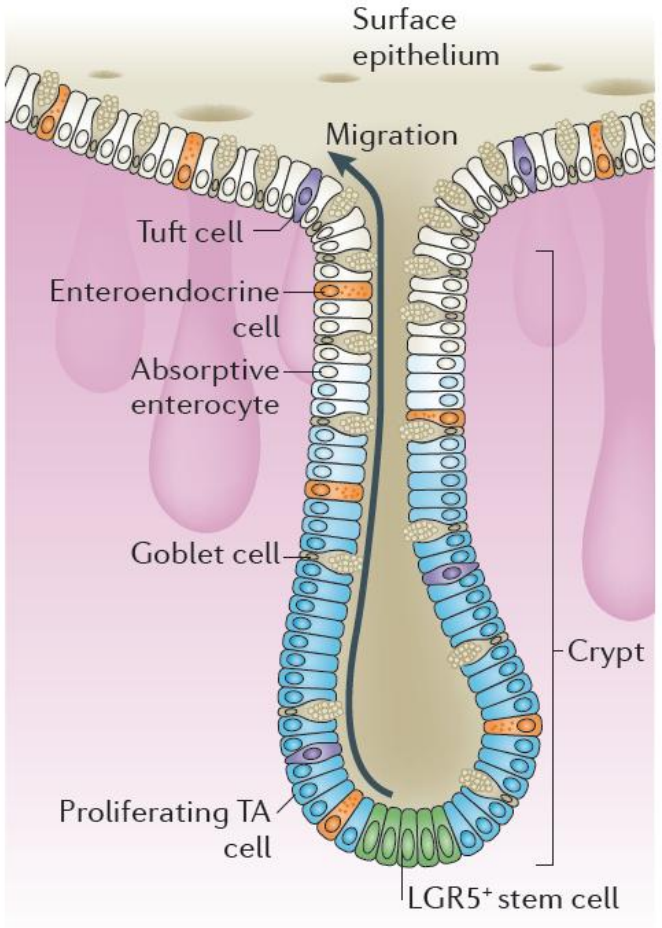
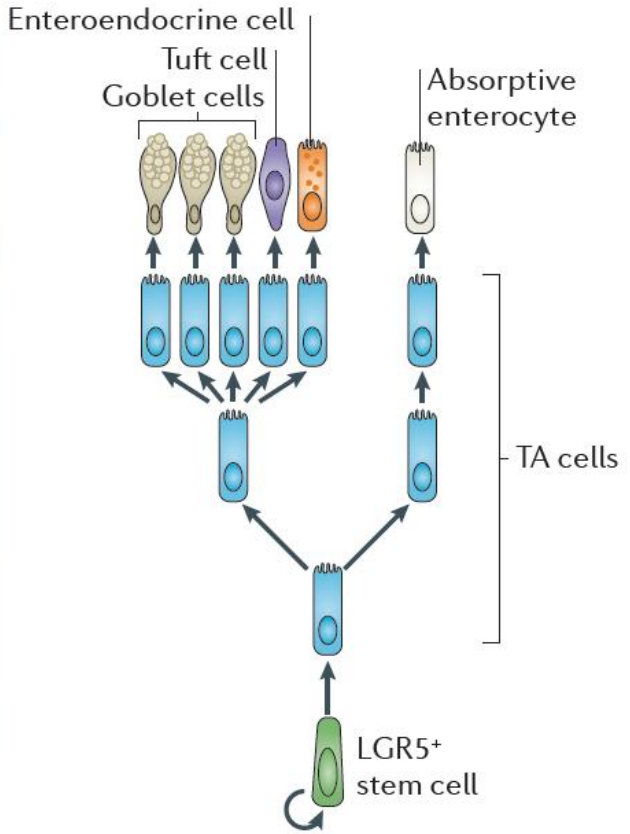
GenPhySE
Génétique, Physiologie et Systèmes d'Elevage

Organisation de l'épithélium intestinal du gros intestin



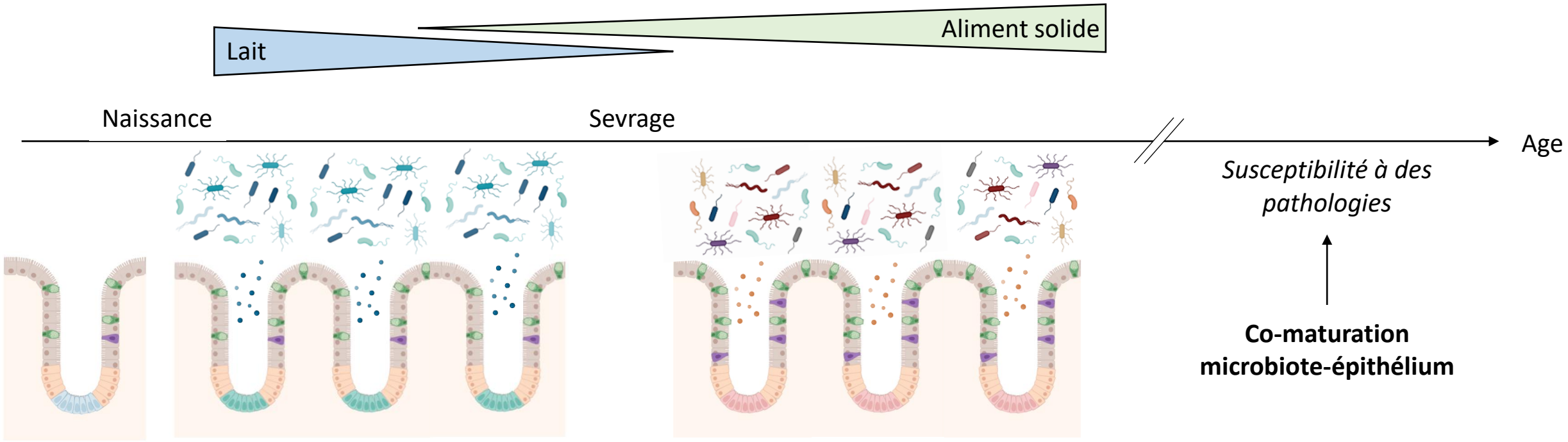




Barker et al., Nat Rev Cell Biol, 2014

TA = transit amplifying cells

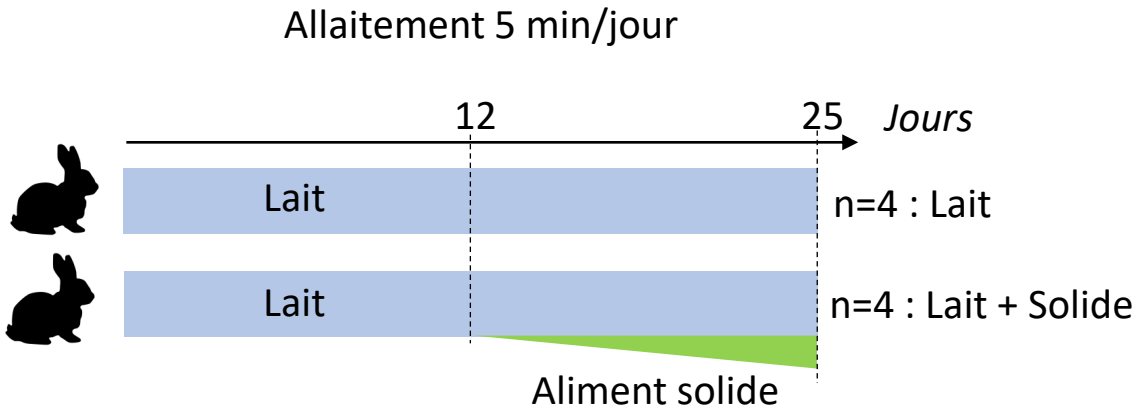
Co-maturation de l'épithélium intestinal et du microbiote

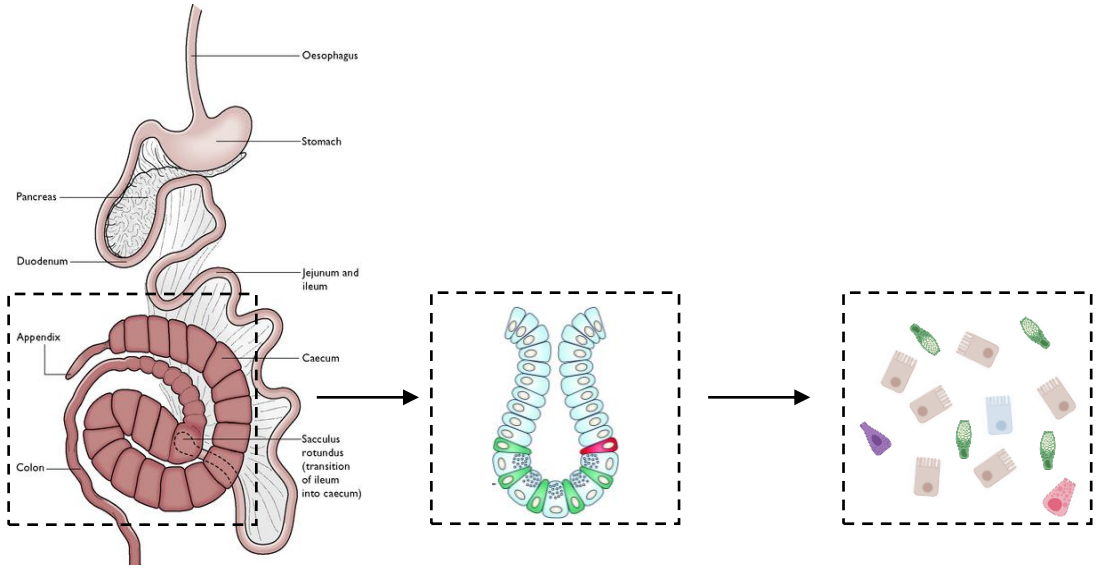


Il est nécessaire de comprendre les mécanismes de co-maturation du microbiote et de l'épithélium pour préserver la santé digestive

Quels sont les effets de l'introduction de l'alimentation solide sur le transcriptome de chaque type de cellules épithéliales intestinales ?

Méthodes



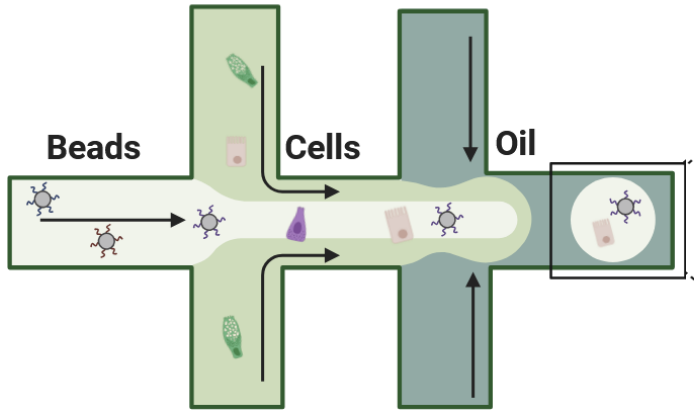


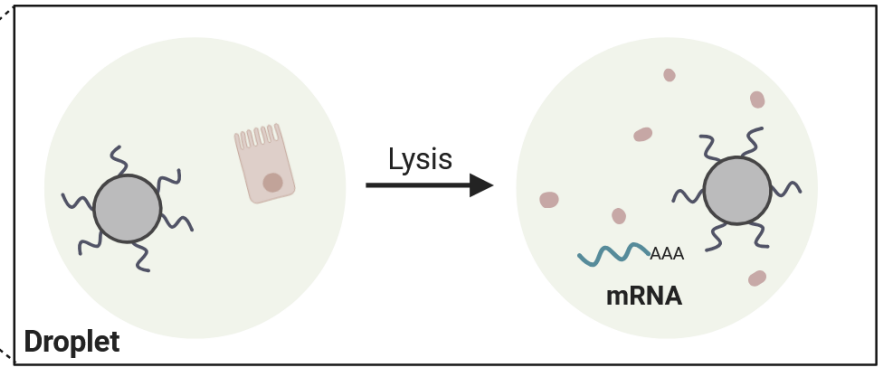
Caecum Crypte épithéliale Cellules isolées

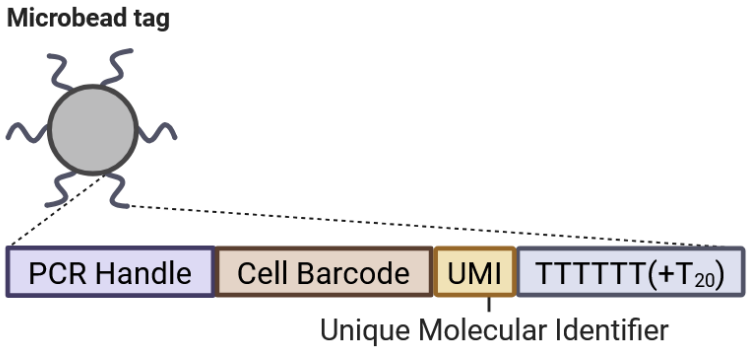
Transcriptomique en cellule unique

Transcriptomique en cellule unique

Emeline Lhuillier







Cédric Cabau

CellRanger

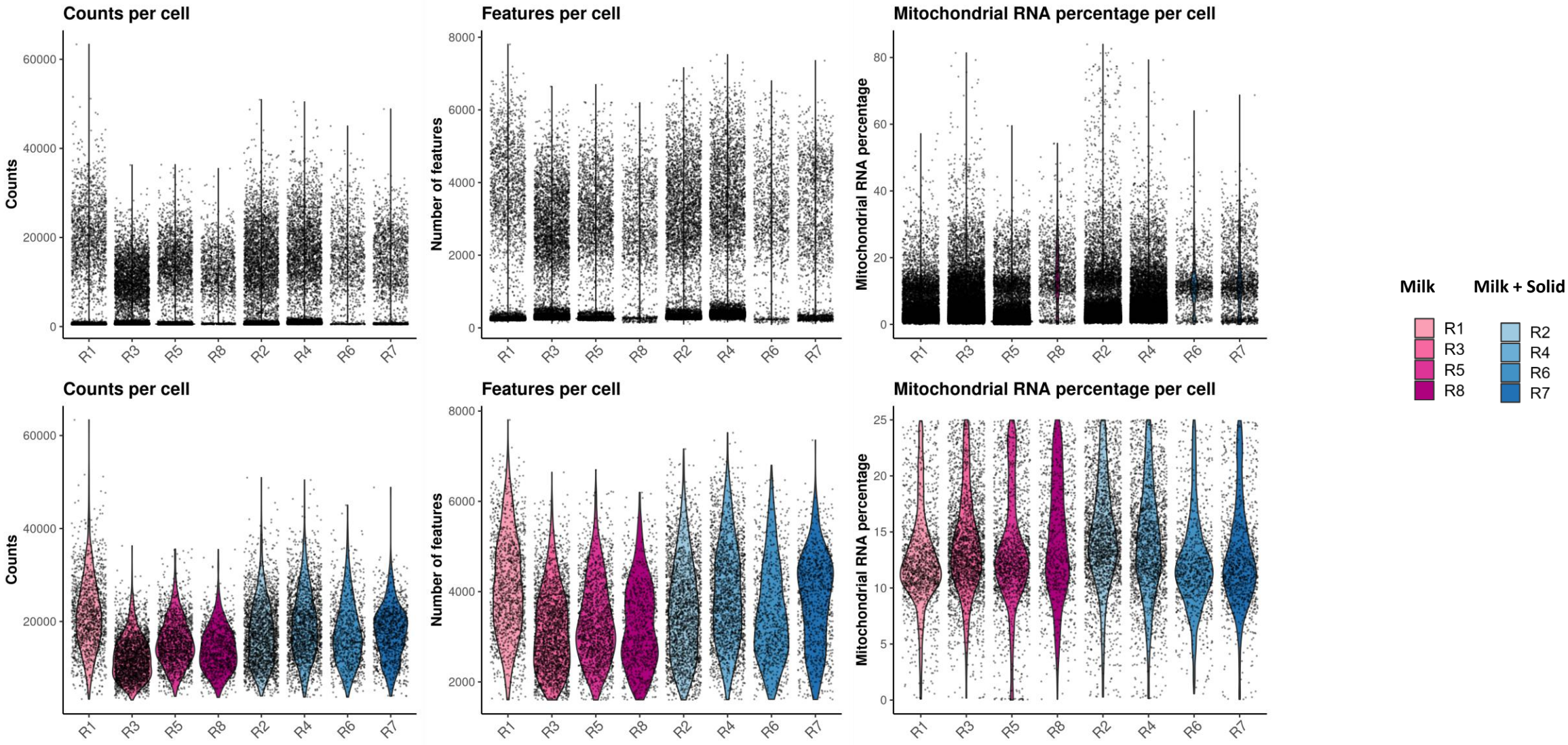
	Cell1	Cell2	...	CellN
Gene1	3	2	.	13
Gene2	2	3	.	1
Gene3	1	14	.	18
...	.	.	.	.
...	.	.	.	.
...	.	.	.	.
GeneM	25	0	.	0

Thèse : **Tania Malonga** (2022-2025)

Nathalie Vialaneix

Martin Beaumont
GenPhySE

Pré-traitement des données



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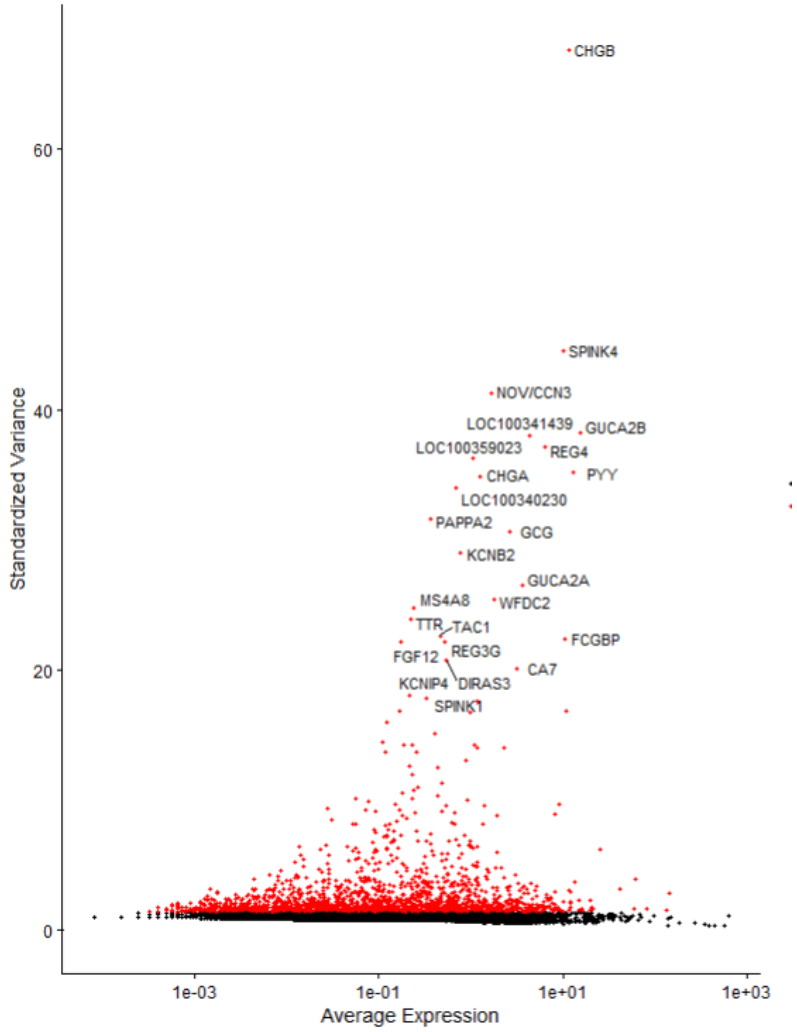
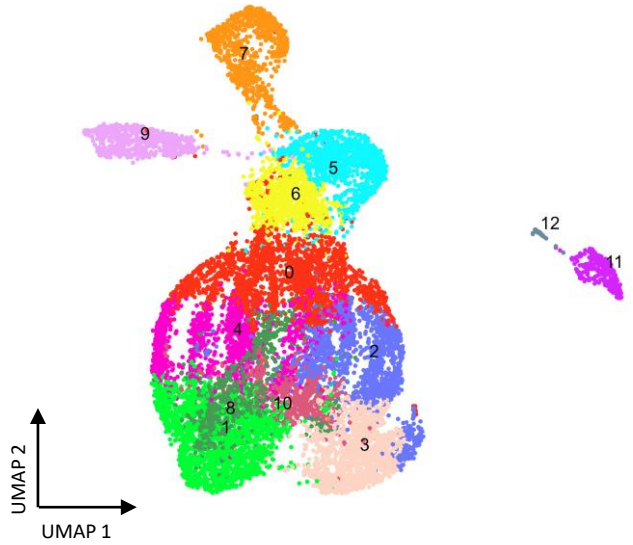
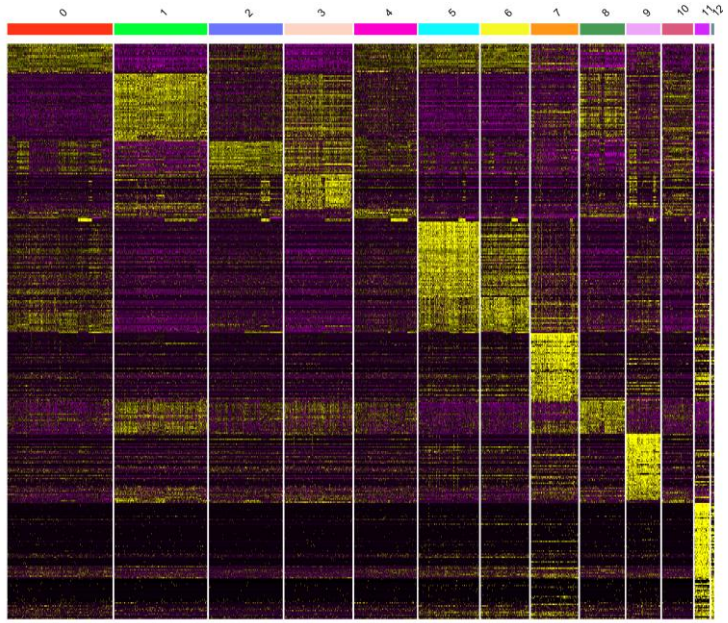
Pré-traitement des données

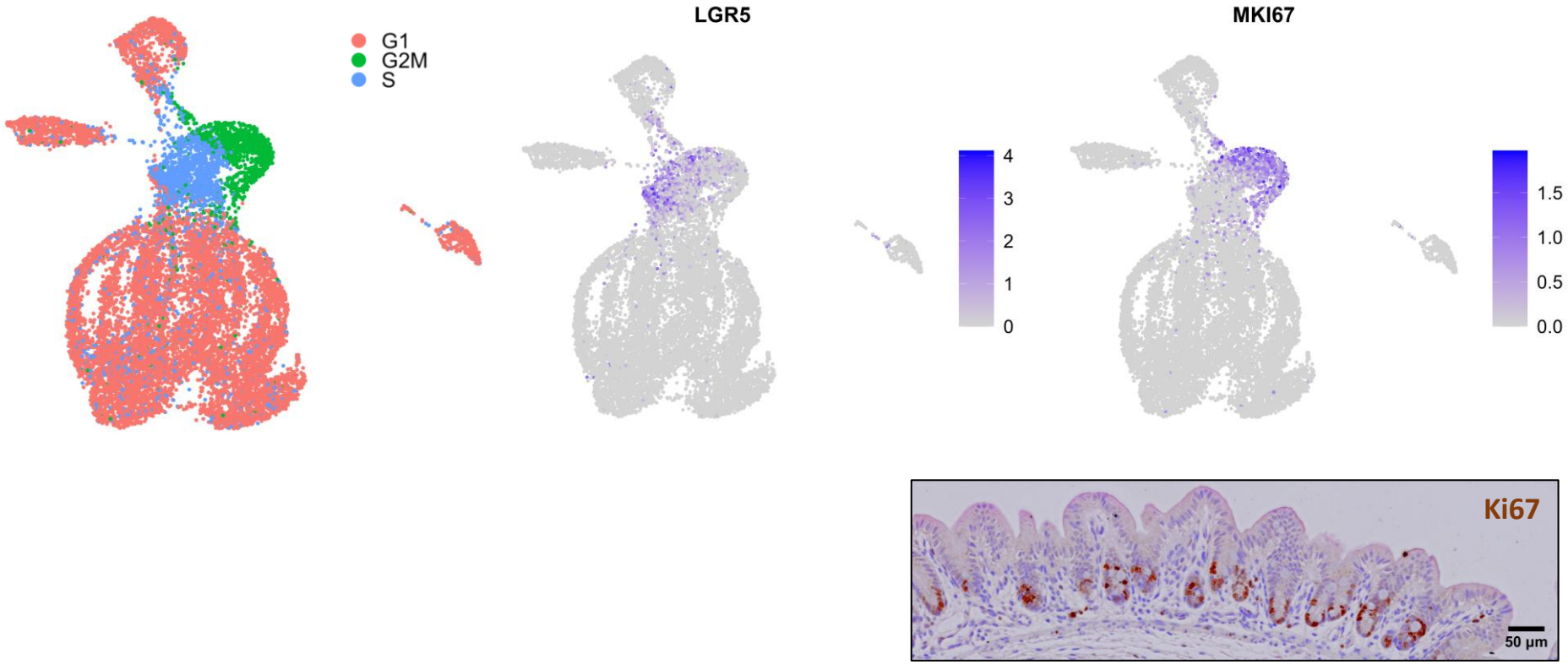
1- Sélection des 3000 gènes les plus variables
2 - ACP
3 - Clustering
4 - UMAP



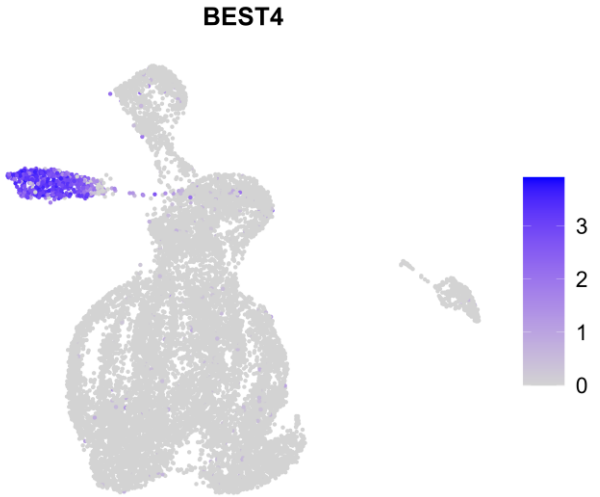


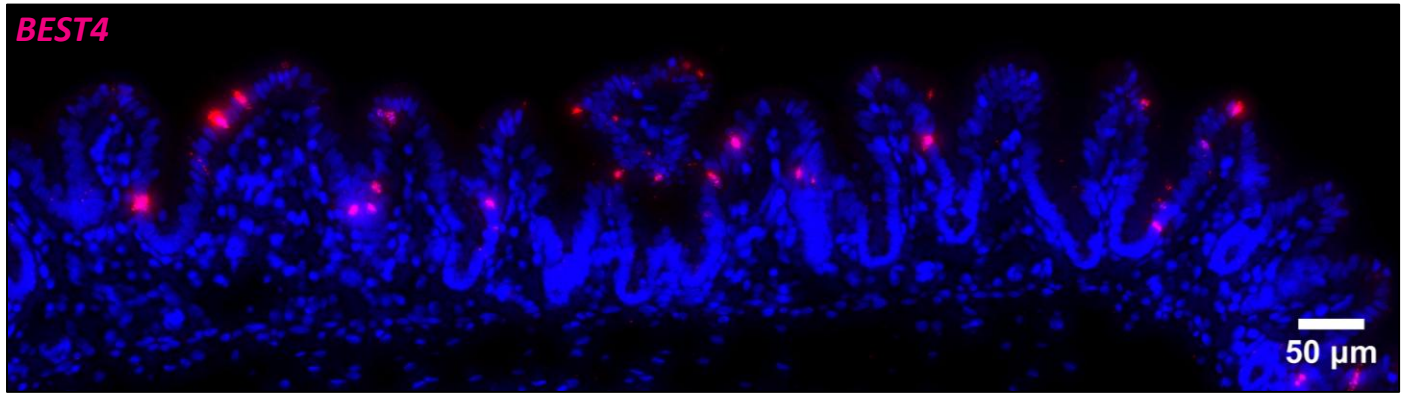


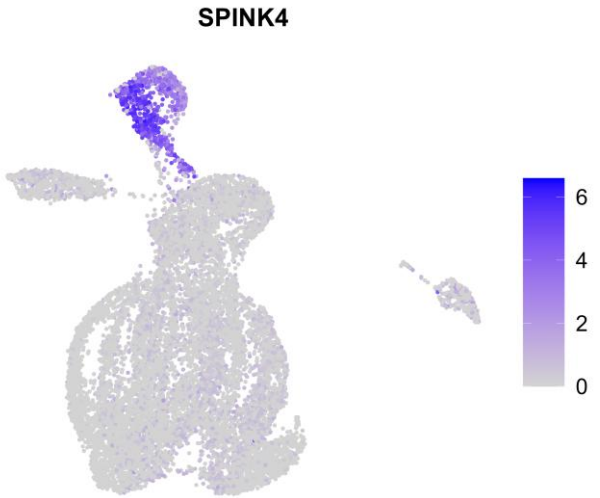
Cellules souches et progénitrices

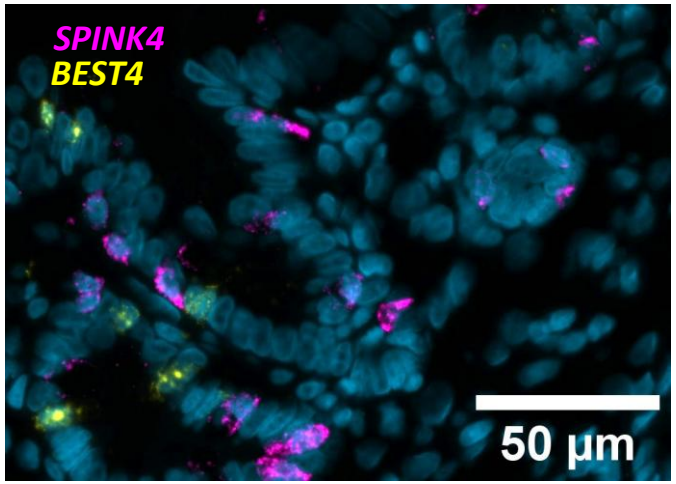


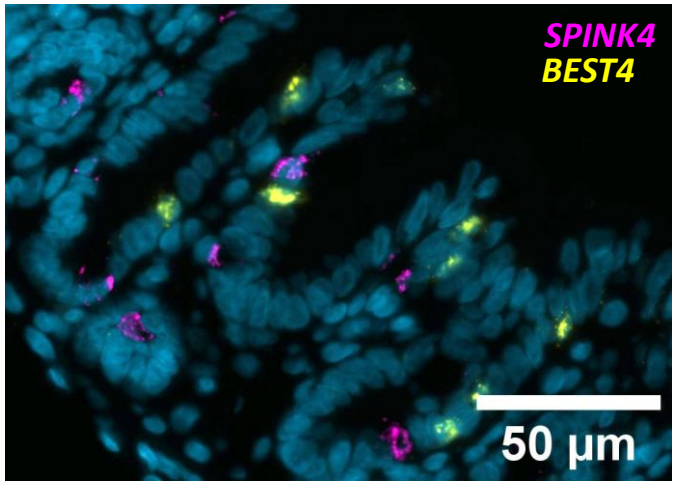
Cellules BEST4 et caliciformes











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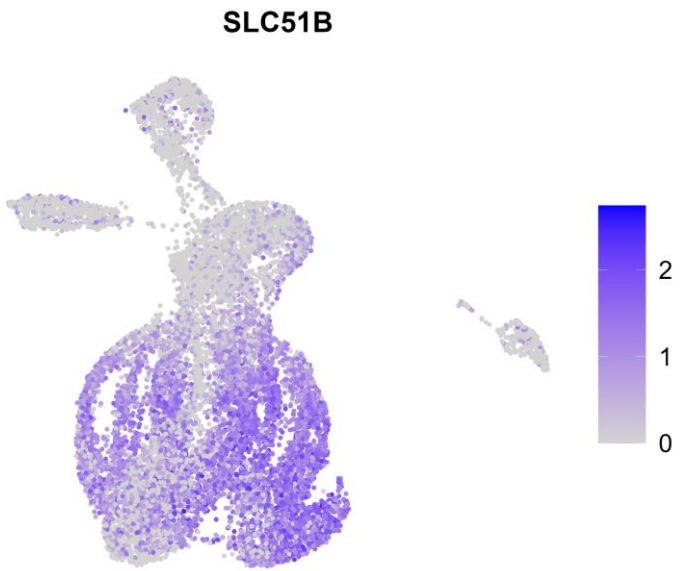
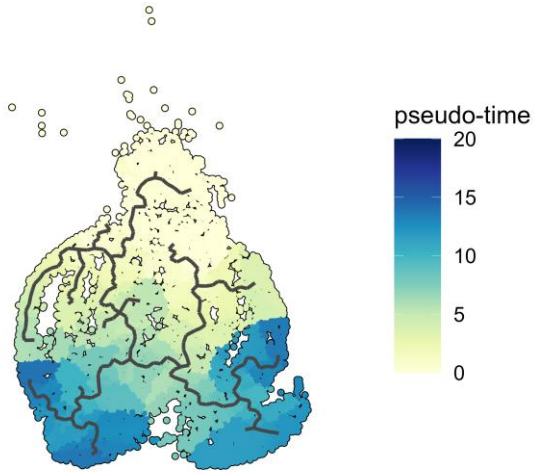
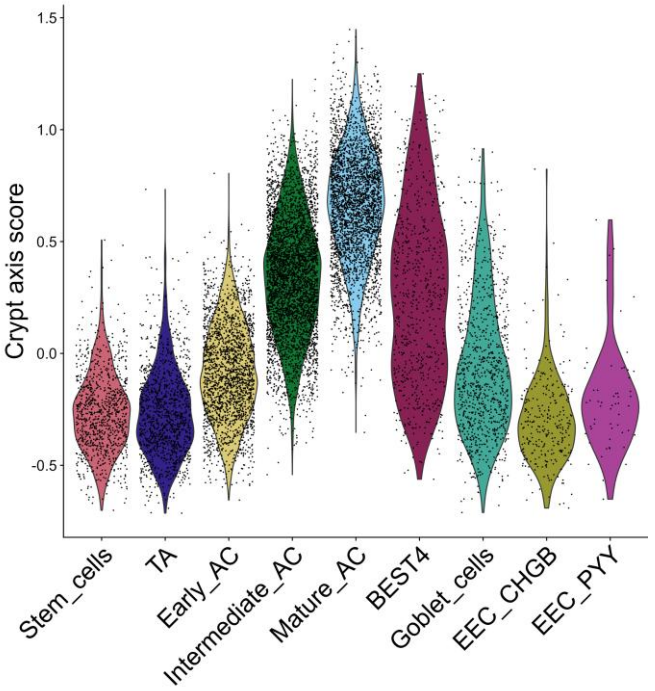
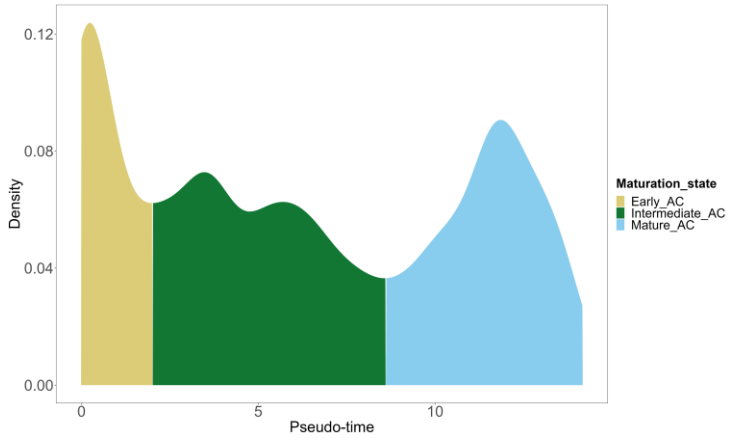
Cellules absorbantes









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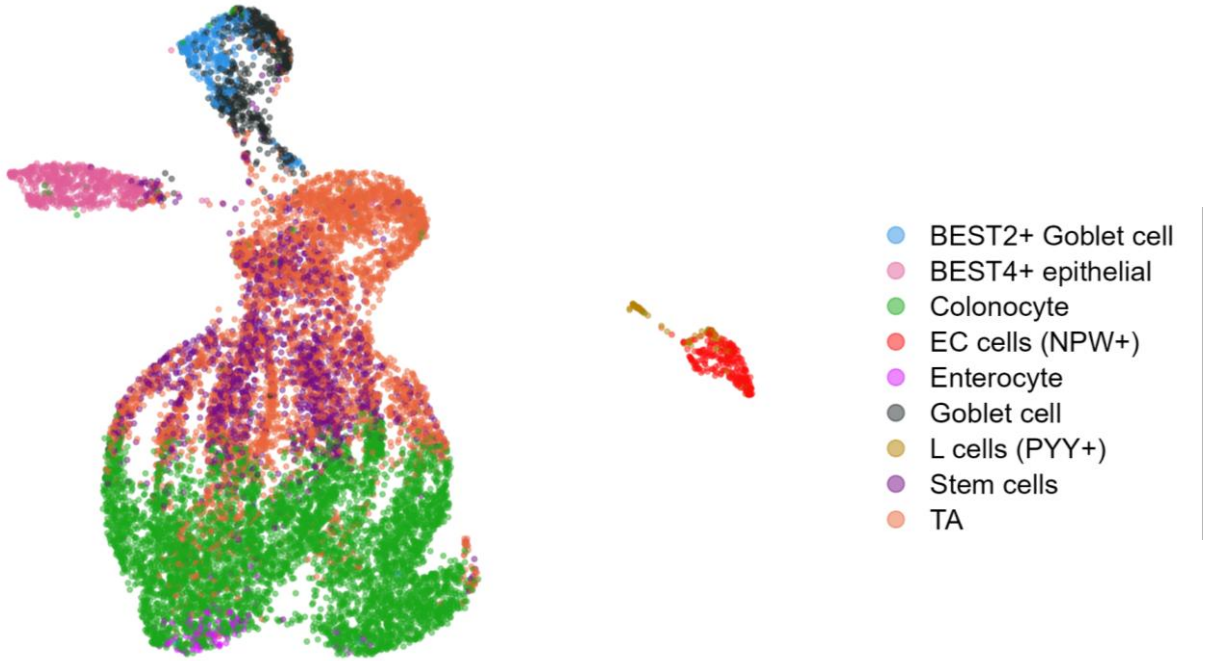
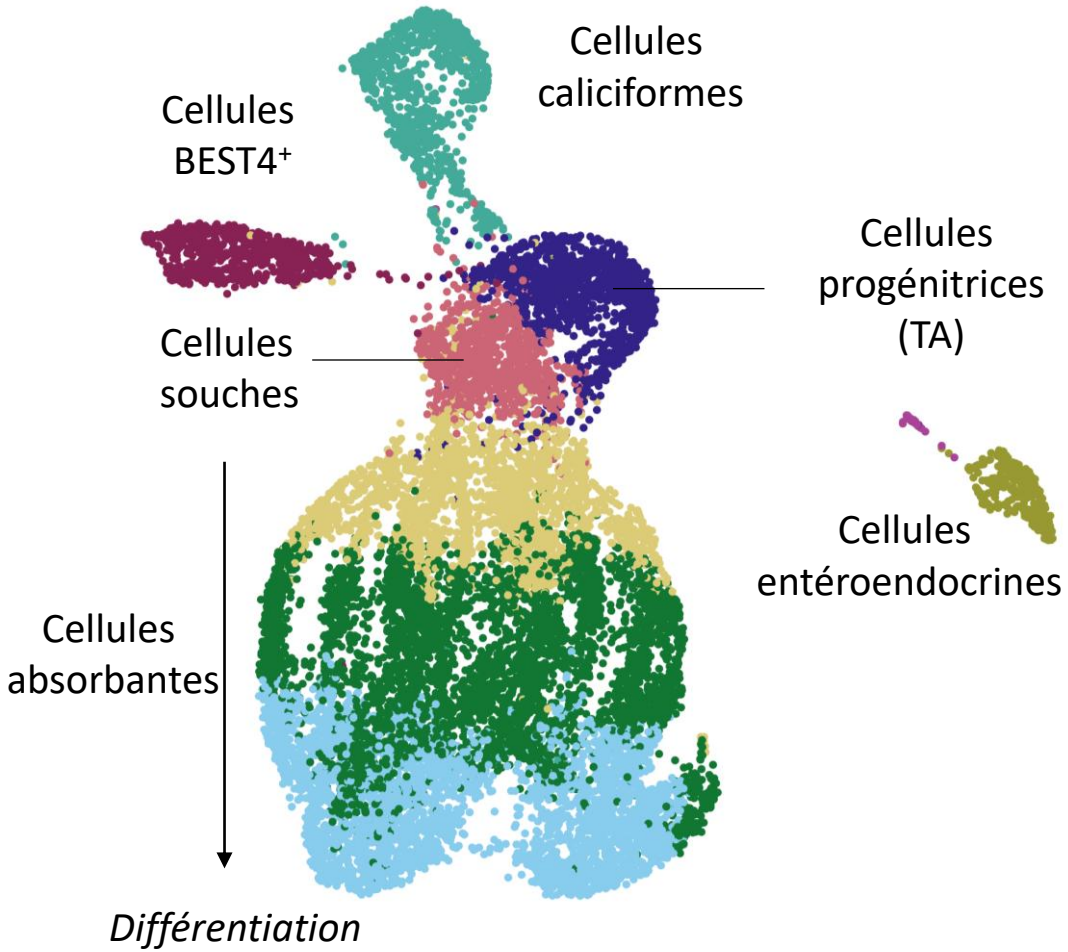
Annotation automatique

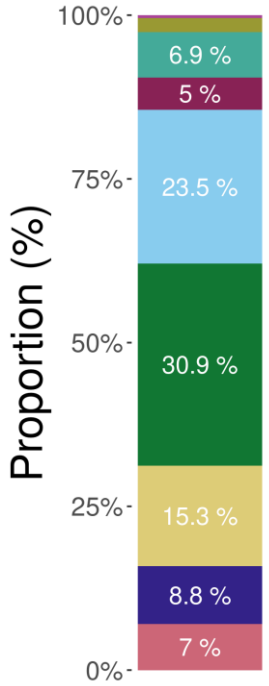
Annotation automatique

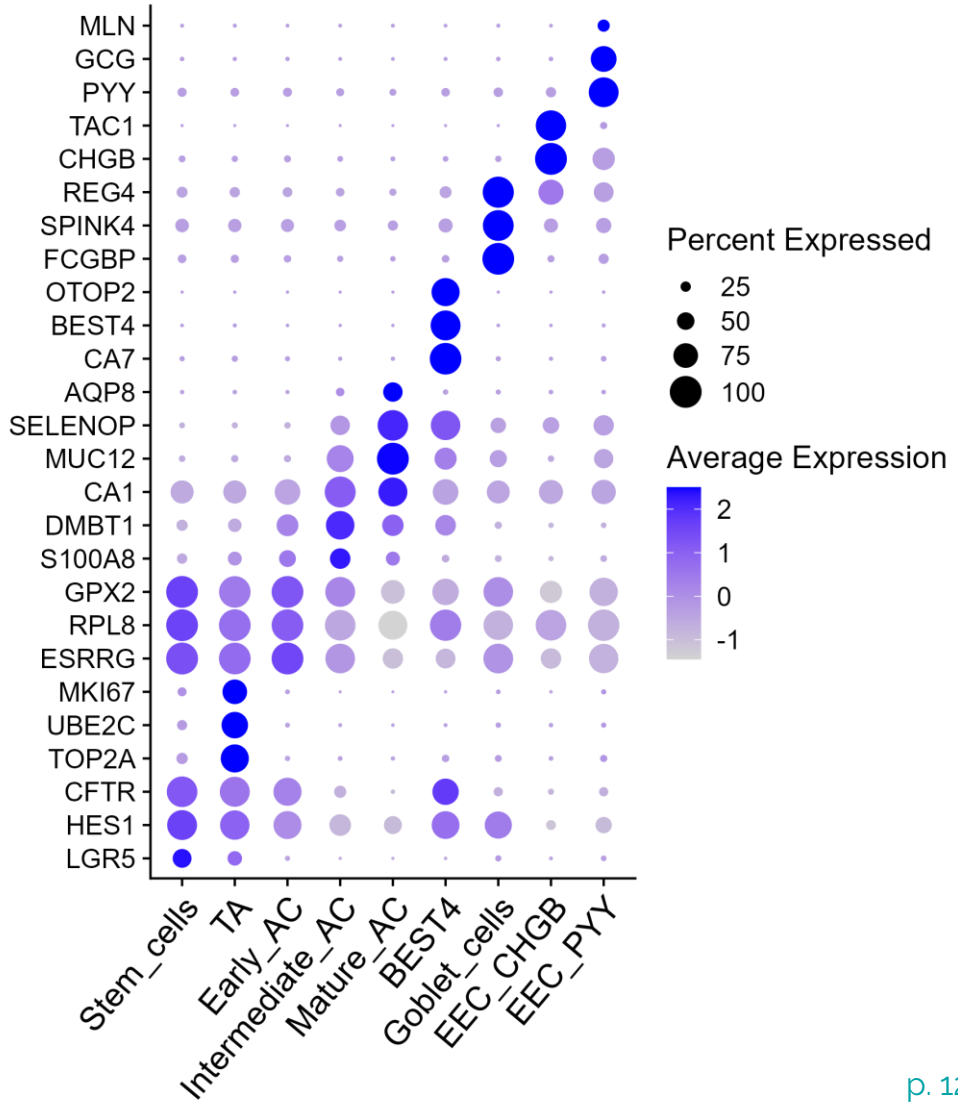


Mapping score

Identification des cellules épithéliales intestinales chez le lapin







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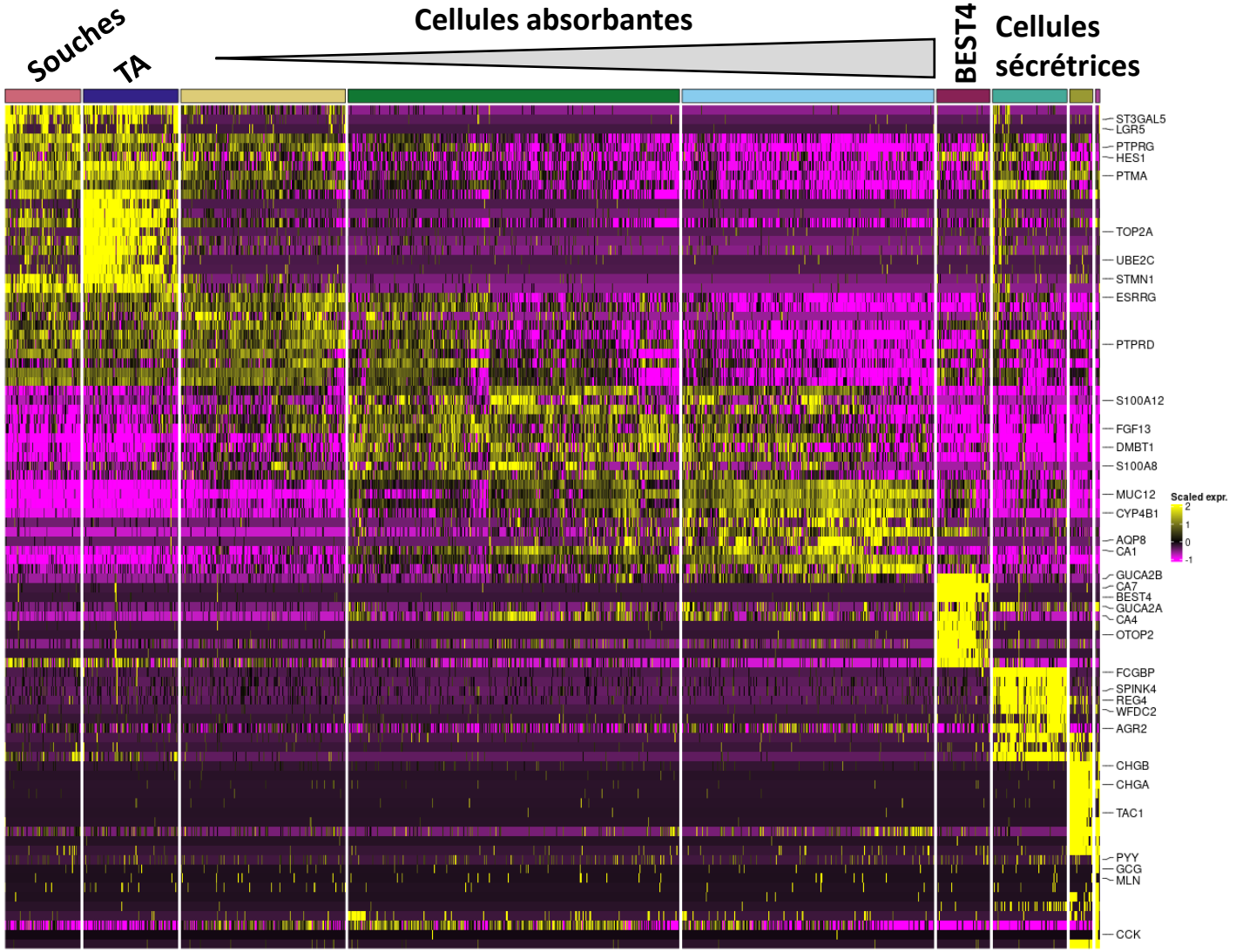
TA: transit amplifying cells
AC: absorptive cells
EEC: enteroendocrine cells

Transcriptome des cellules épithéliales intestinales chez le lapin



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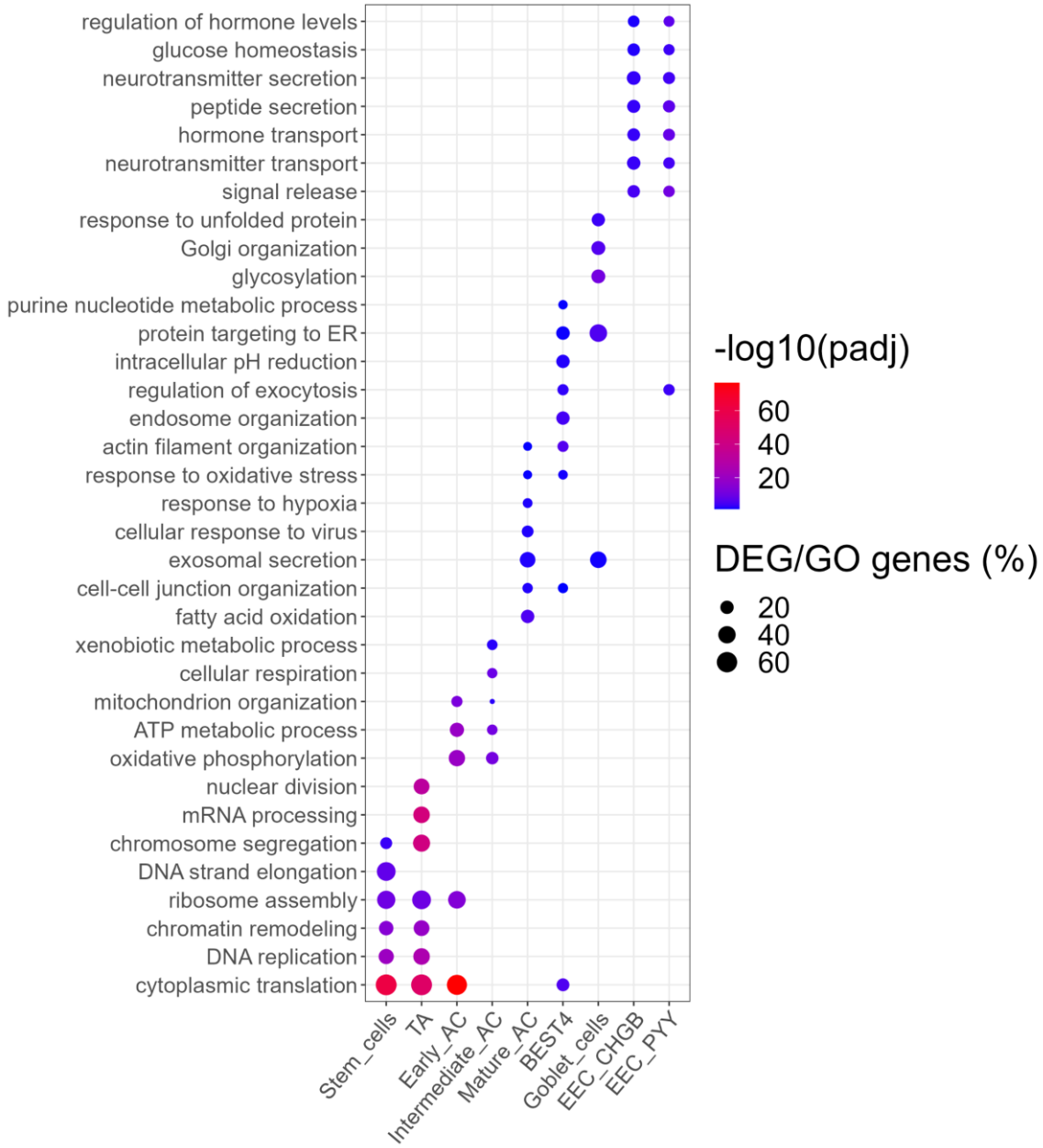
Transcriptome des cellules épithéliales intestinales chez le lapin



TA: transit amplifying cells
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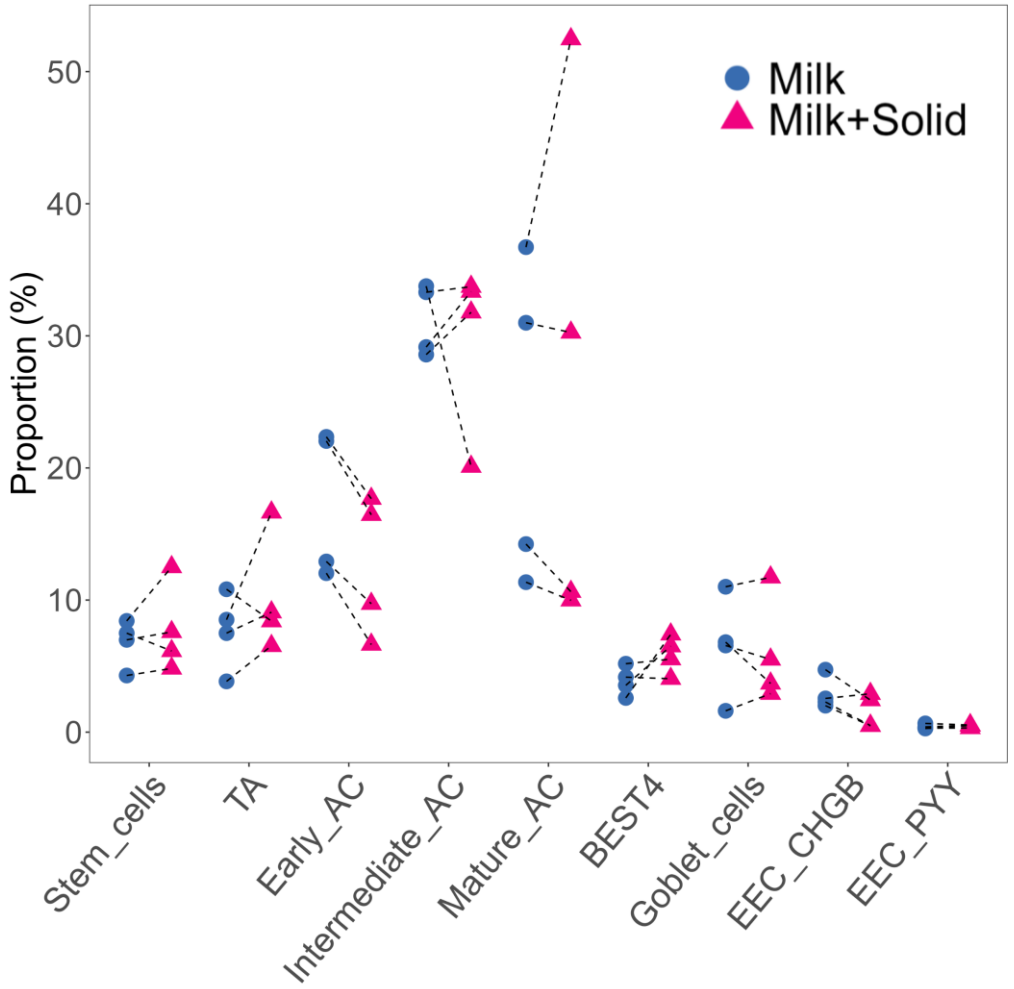
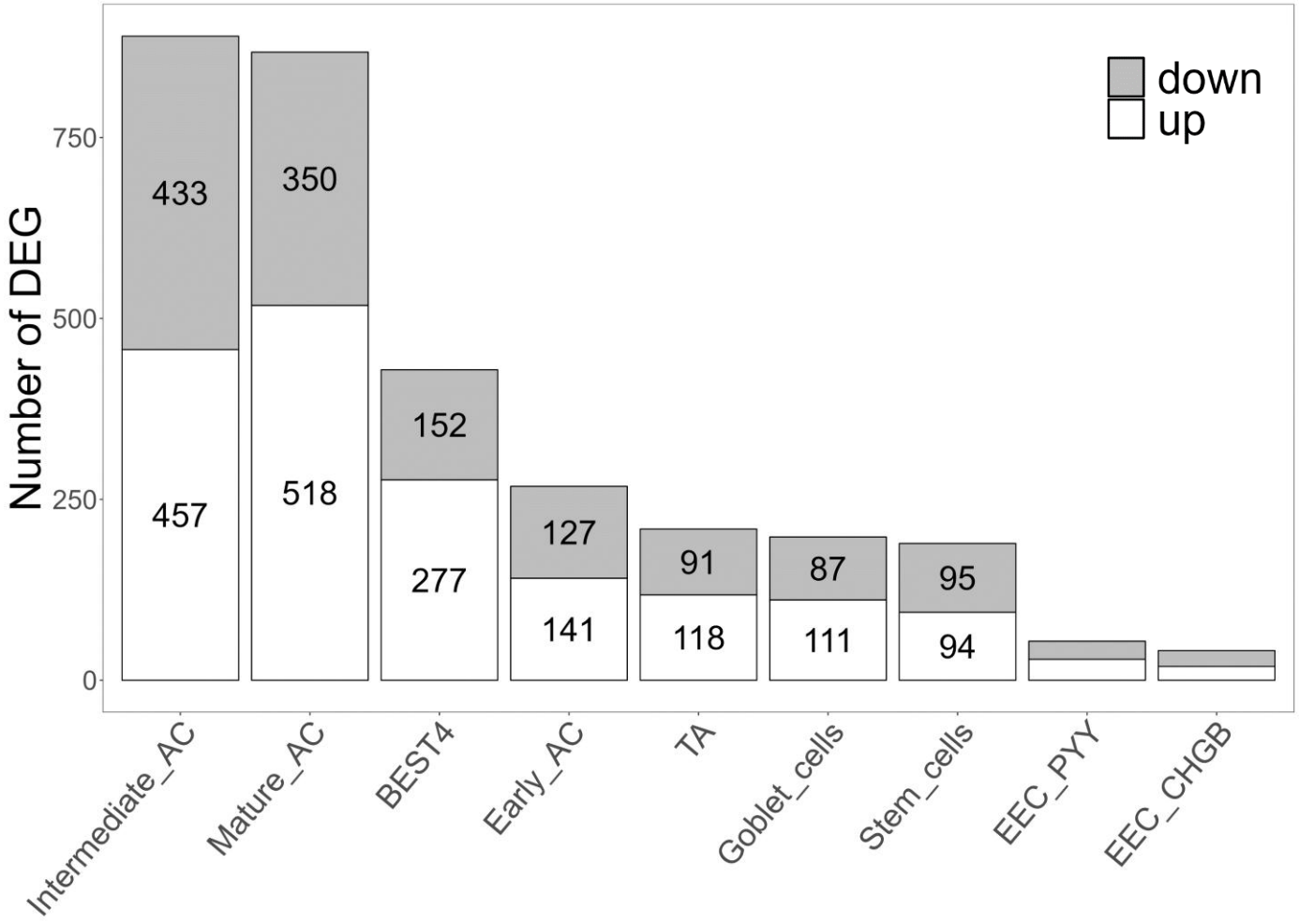
Effets de l'introduction de l'alimentation solide

Proportion des types de cellules épithéliales



Gènes différentiellement exprimés (DEG)



TA: transit amplifying cells
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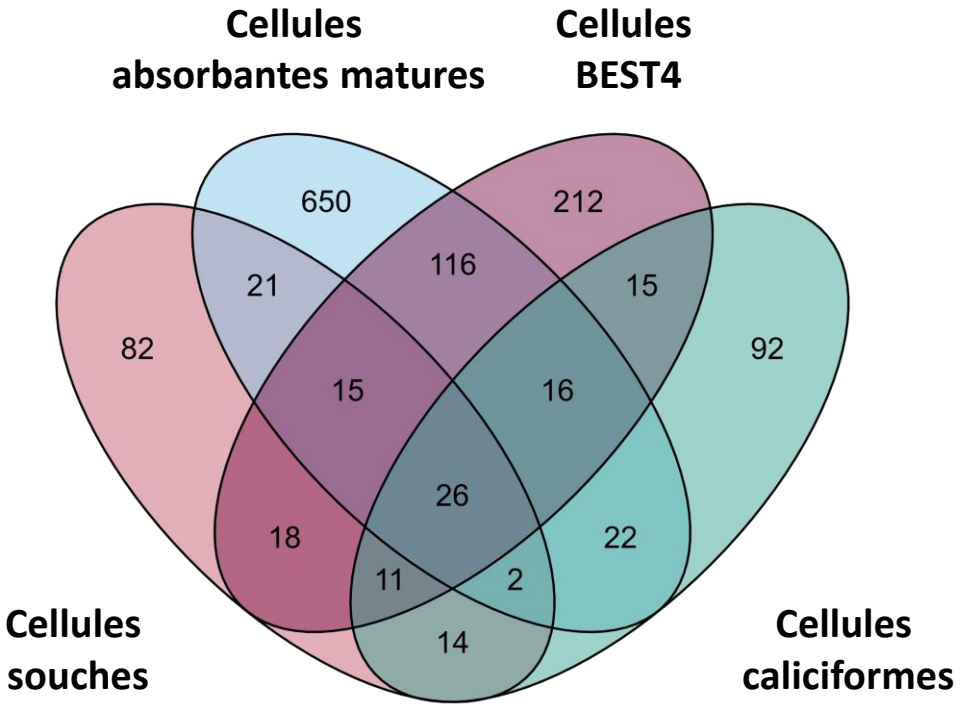
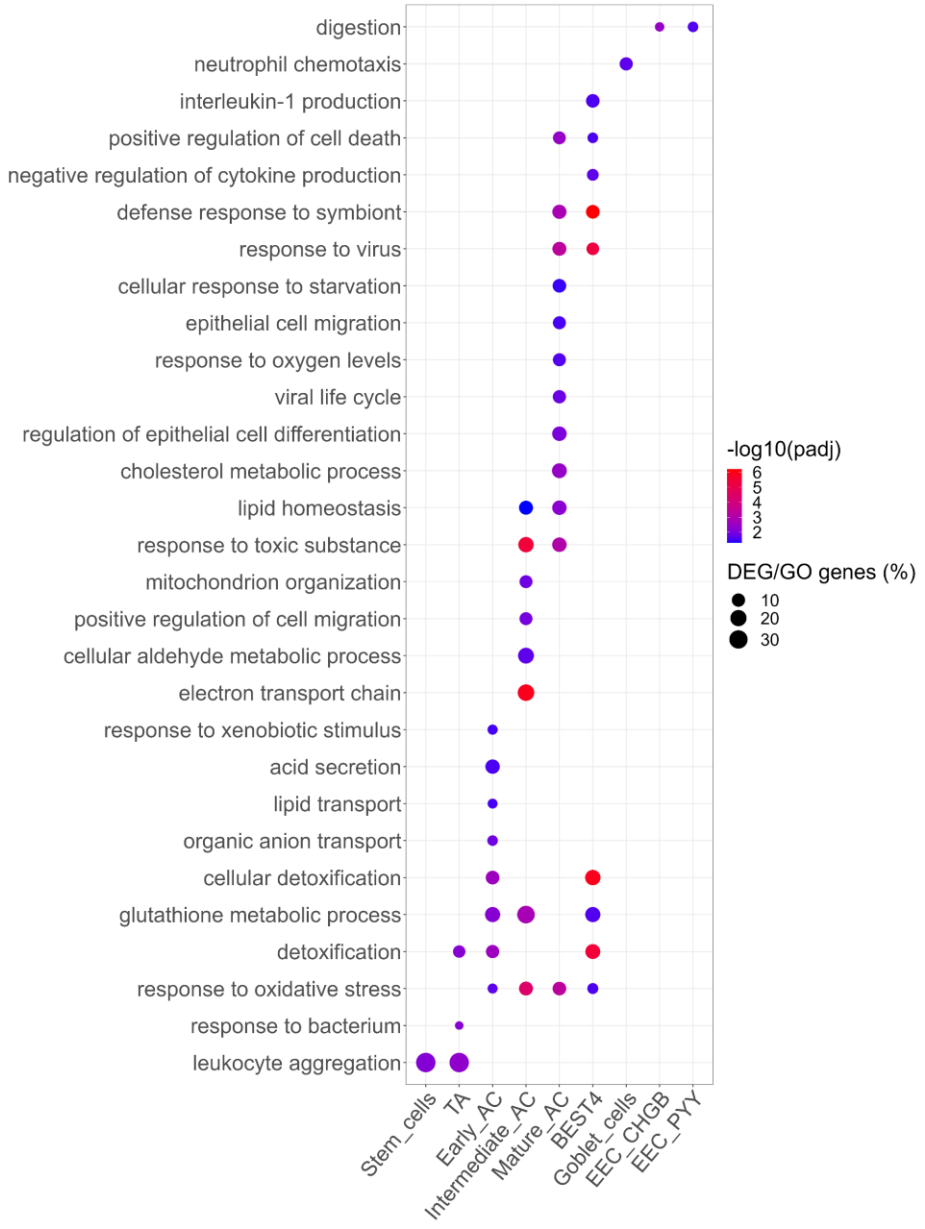
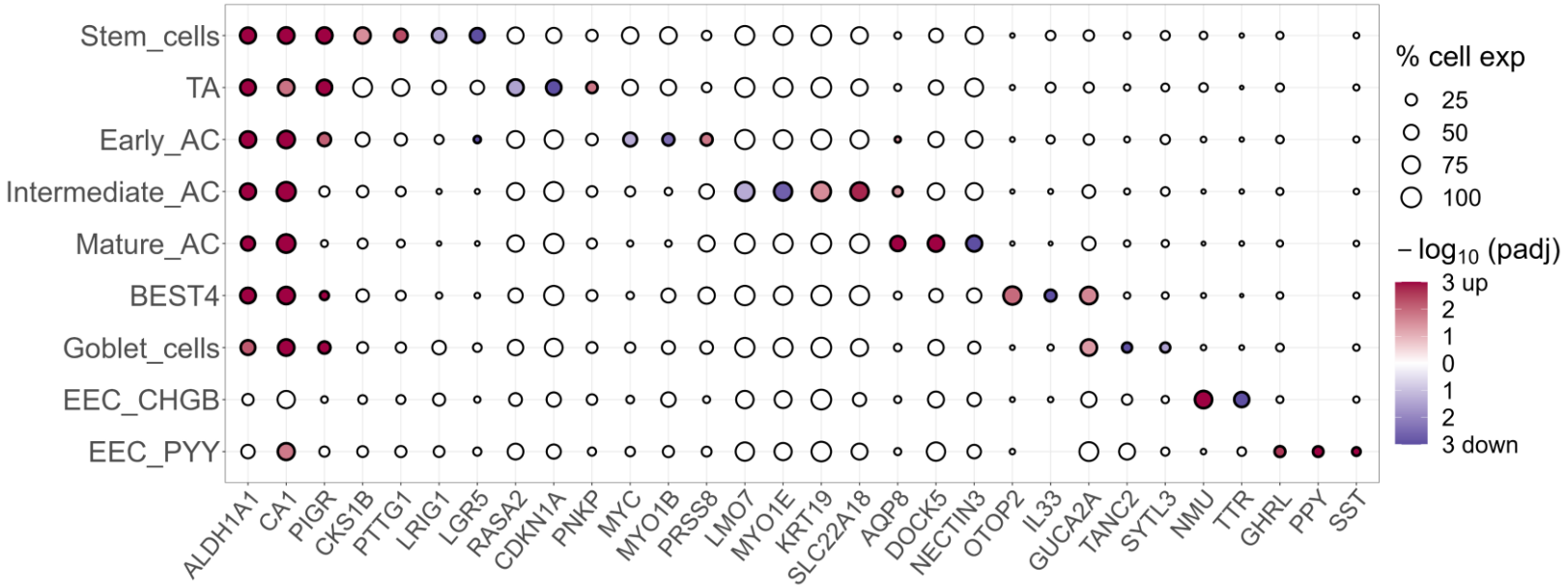
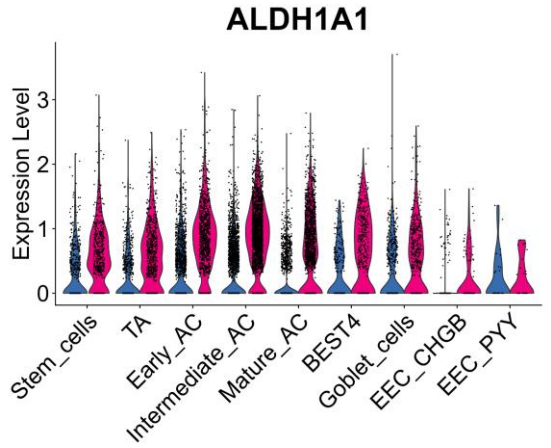
Effets de l'introduction de l'alimentation solide

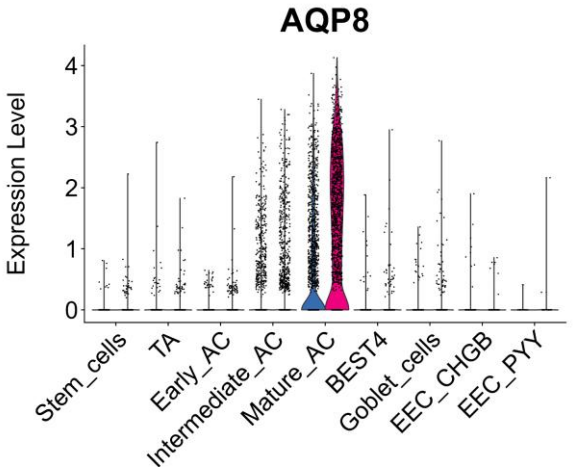




Effets de l'introduction de l'alimentation solide



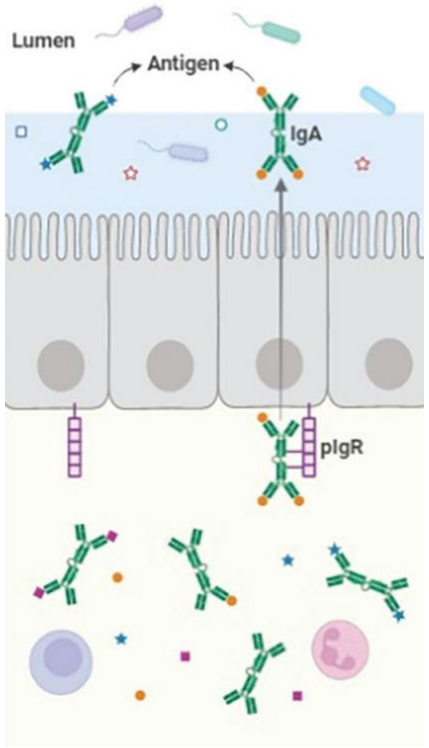


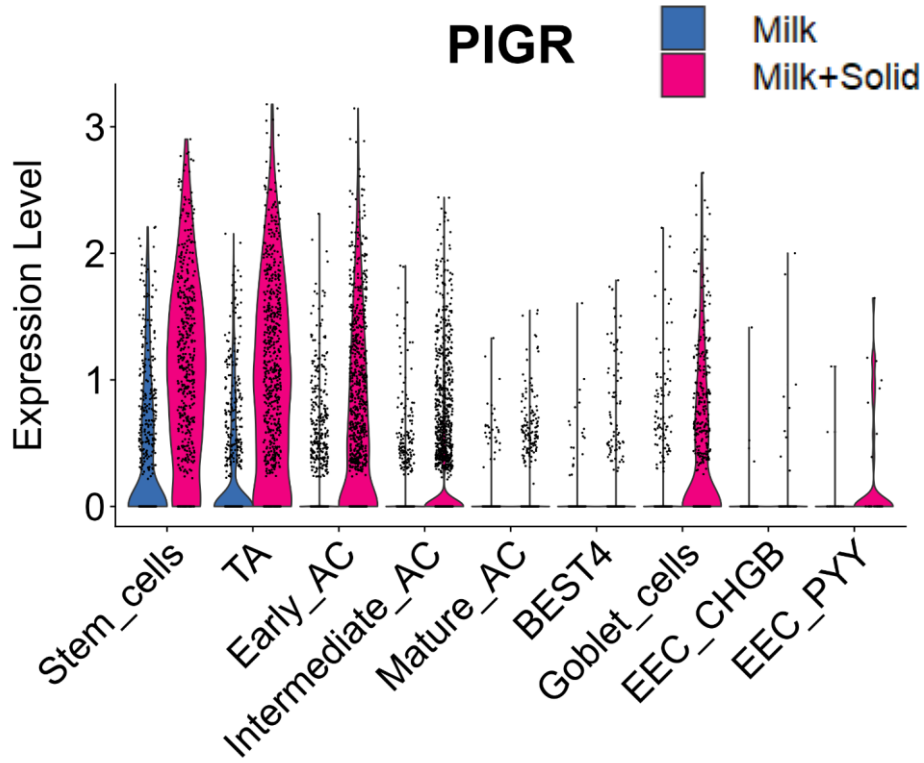


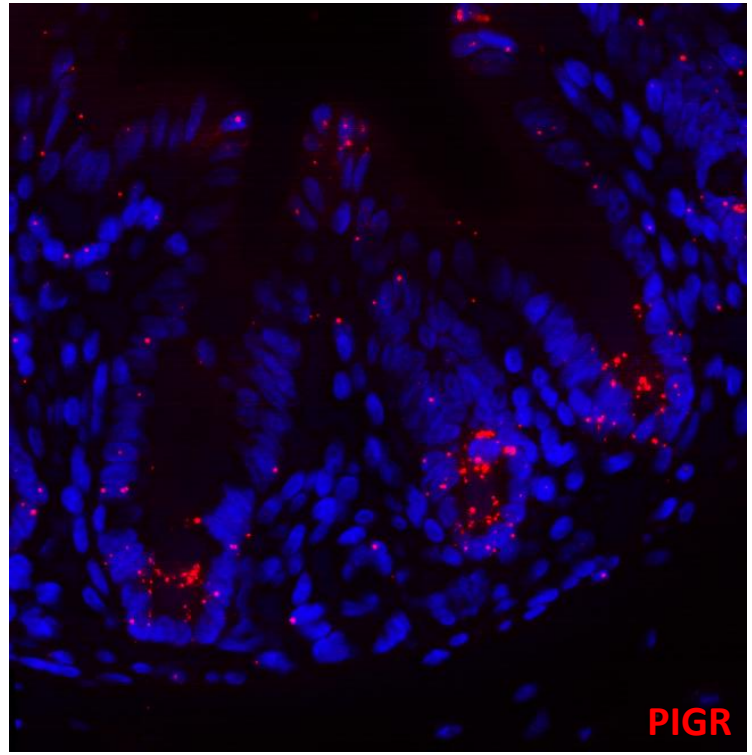
TA: transit amplifying cells
AC: absorptive cells
EEC: enteroendocrine cells

Transport des immunoglobulines

PIGR : Polymeric Immunoglobulin receptor







Les cellules souches épithéliales intestinales pourraient contribuer à la sécrétion des immunoglobulines

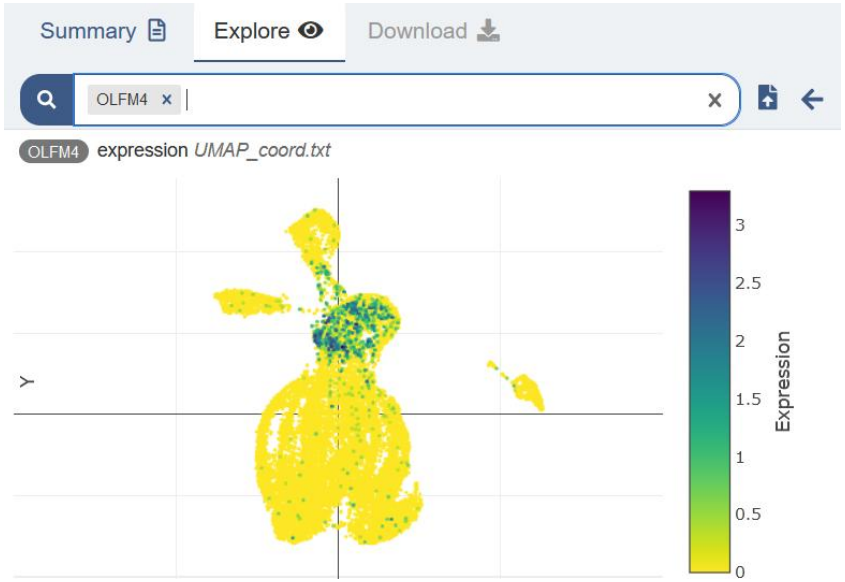
TA: transit amplifying cells
AC: absorptive cells p. 18
EEC: enteroendocrine cells

cmgh
CELLULAR AND MOLECULAR GASTROENTEROLOGY AND HEPATOLOGY

ORIGINAL RESEARCH

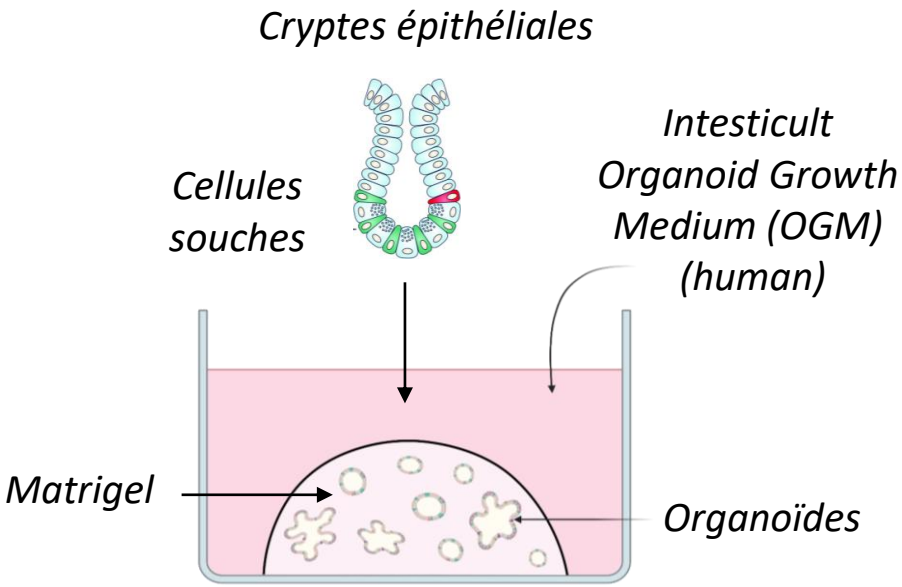
A Single-Cell Atlas of Transcriptome Changes in the Intestinal Epithelium at the Suckling-to-Weaning Transition in Male Rabbits

Tania Malonga,[1,2] Christelle Knudsen,[1] Julie Alberge,[1] Emeline Lhuillier,[3] Patrick Aymard,[1] Elisabeth Jones,[1] Corinne Lencina,[1] Manon Despeyroux,[1] Elodie Riant,[4] Cédric Cabau,[5] Alyssa Ivy,[6] Crystal L. Loving,[6] Nathalie Vialaneix,[2,7,§] and Martin Beaumont[1,§]

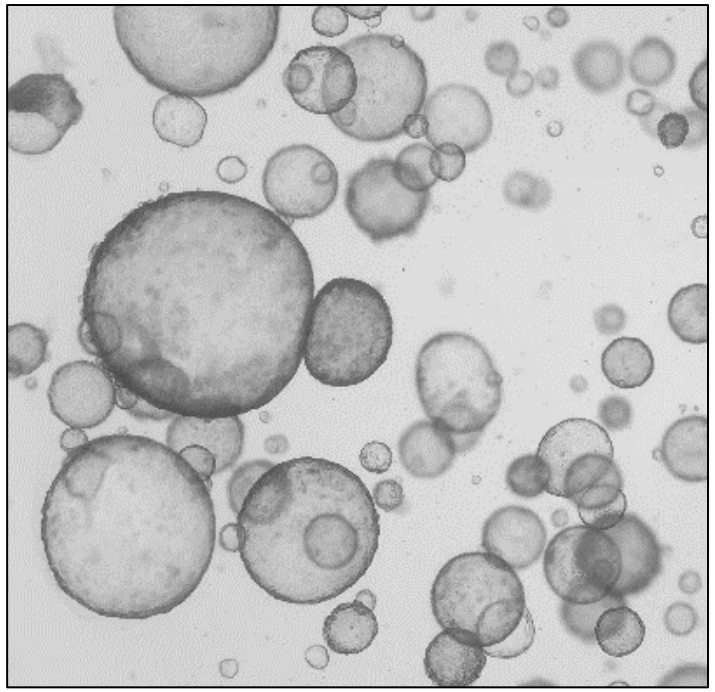


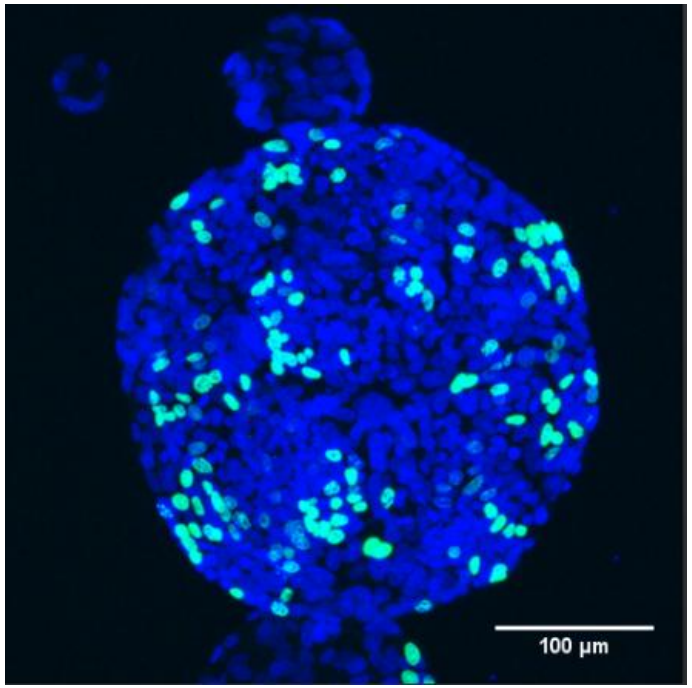
Quelle est la contribution des métabolites du microbiote intestinal à la maturation de l'épithélium intestinal lors de la transition alimentaire du sevrage ?

Organoïdes intestinaux de lapin



Mussard et al., Stem Cell Res, 2020

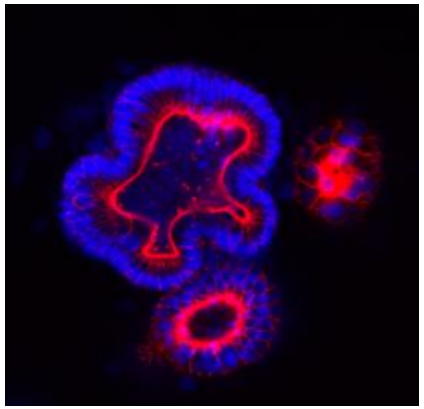


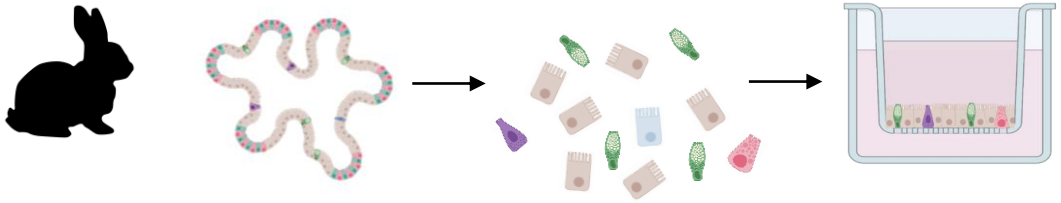


ADN **EdU**

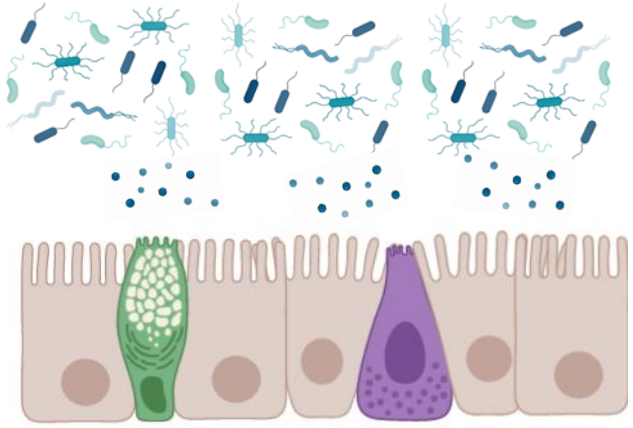
Monocouches de cellules d'organoïdes intestinaux de lapin

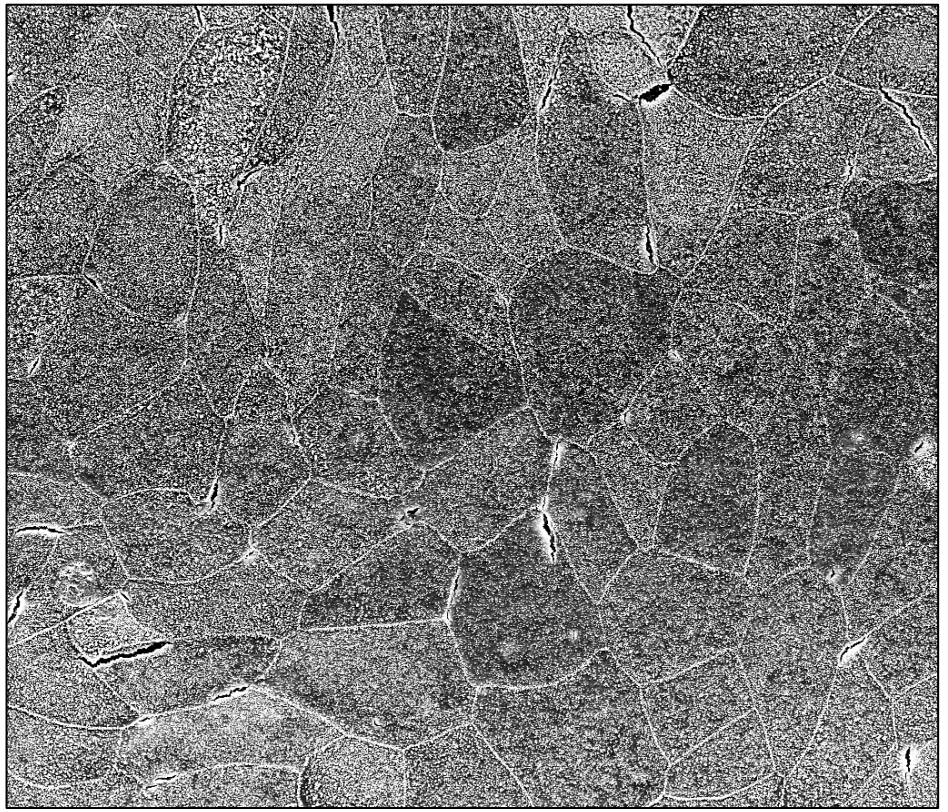
ADN
Actine

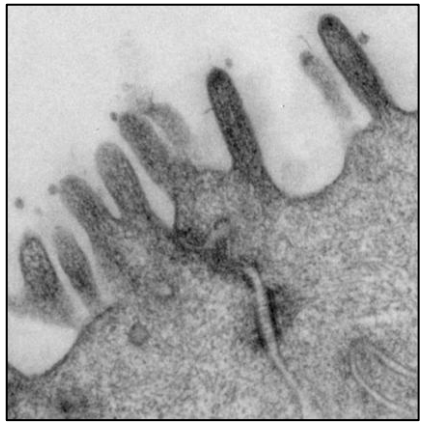


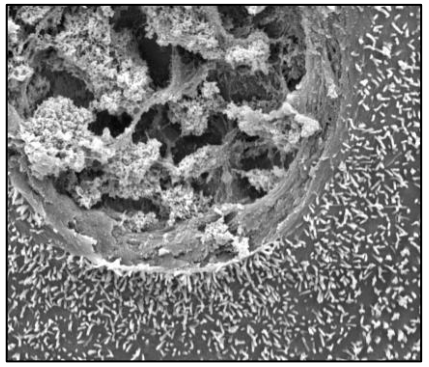


Le pôle apical des cellules épithéliales est difficilement accessible dans les organoïdes cultivés en 3D









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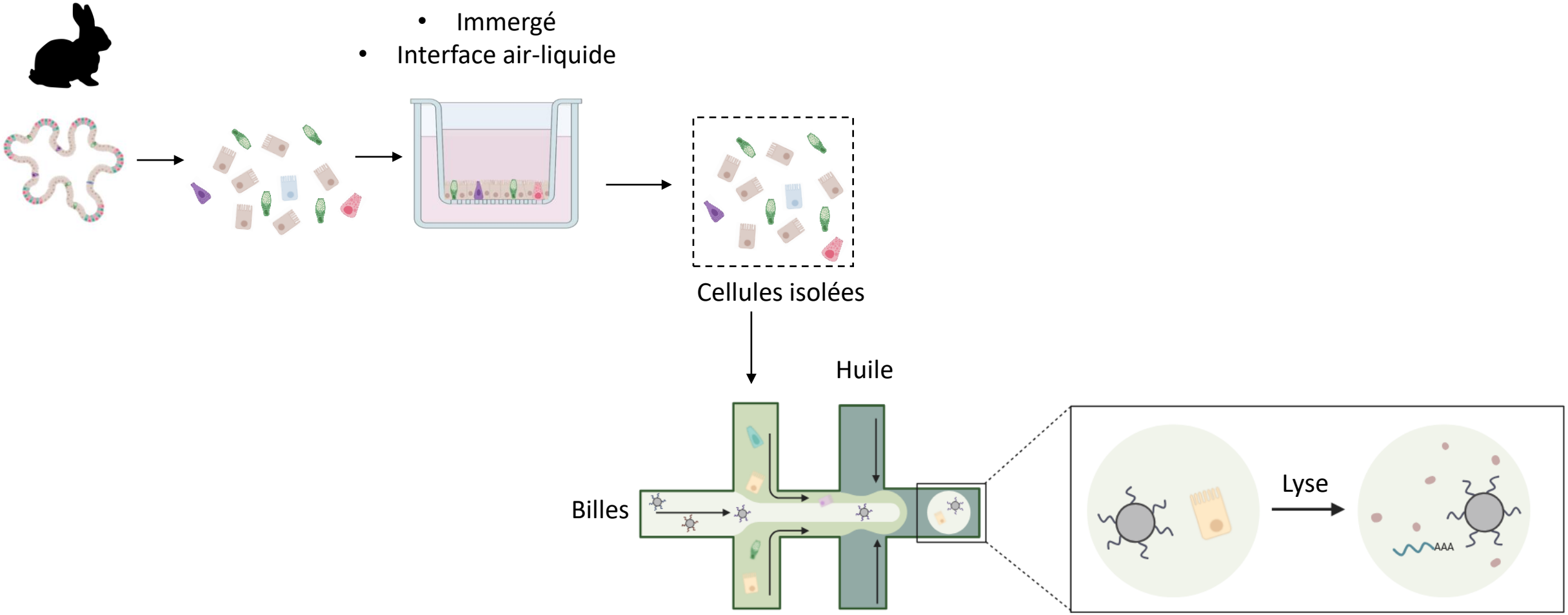
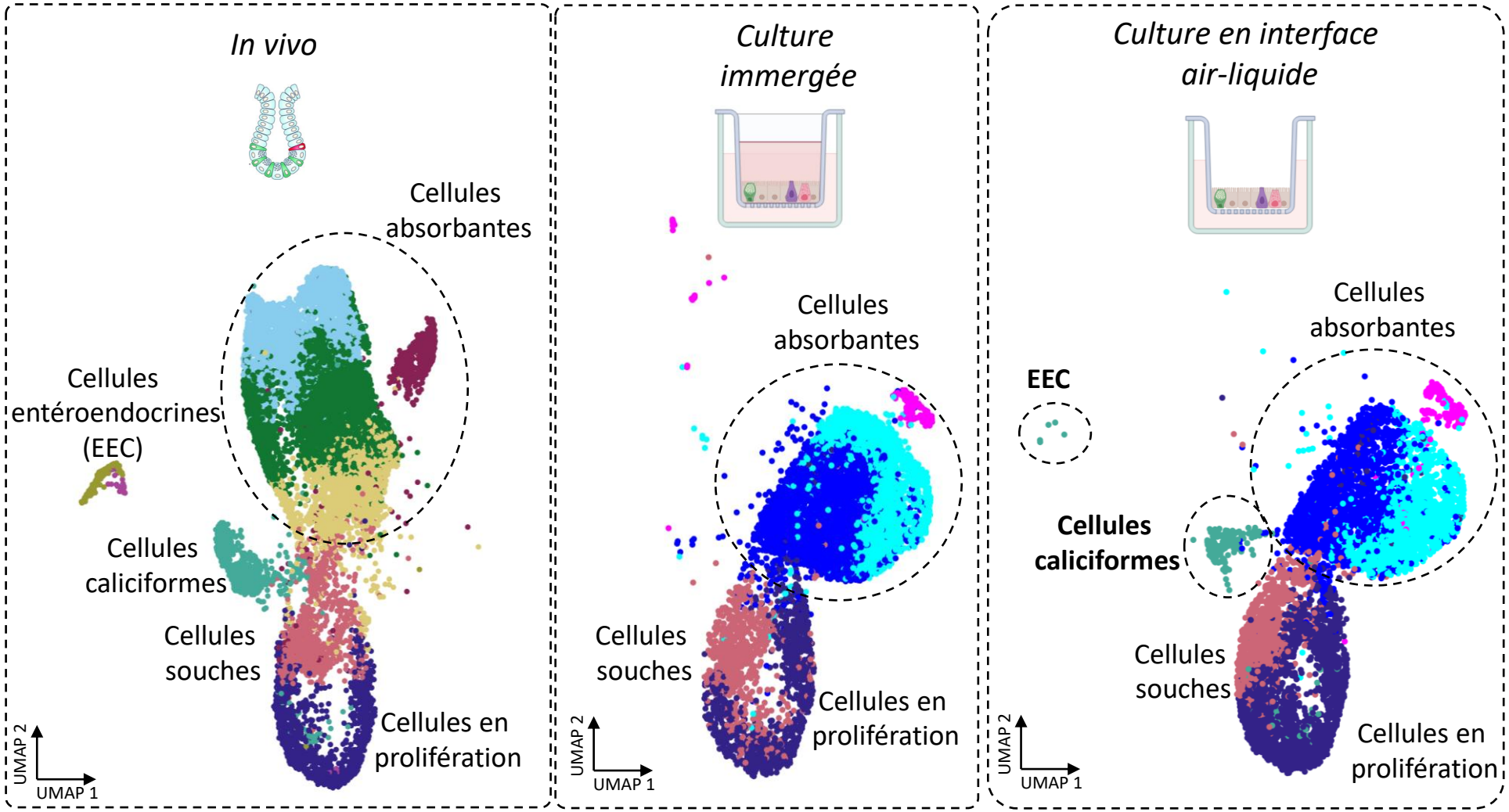
Transcriptomique en cellule unique

Thèse : **Tania Malonga** (2022-2025)



Séquençage en cellule unique

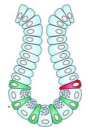
Transcriptomique en cellule unique

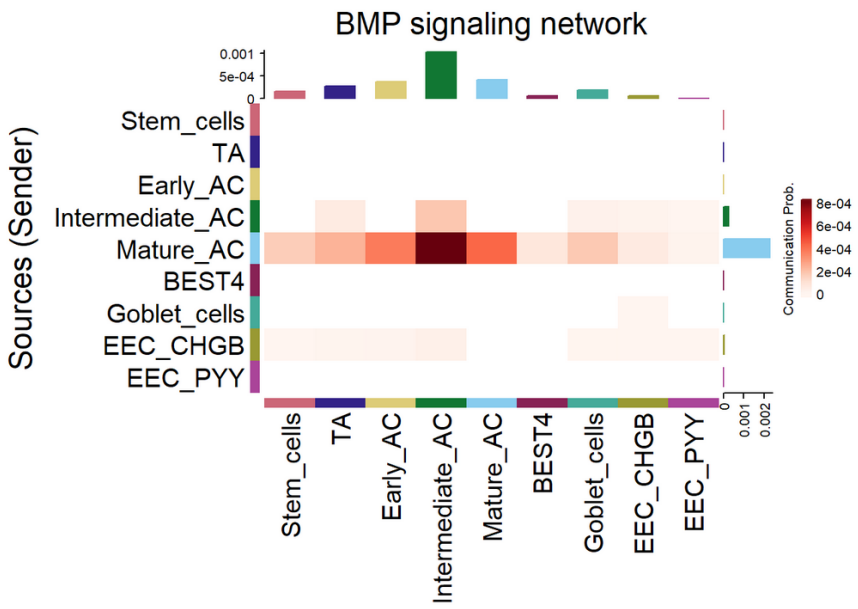


Malonga et al., en révision

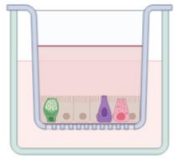
Communications inter-cellulaire

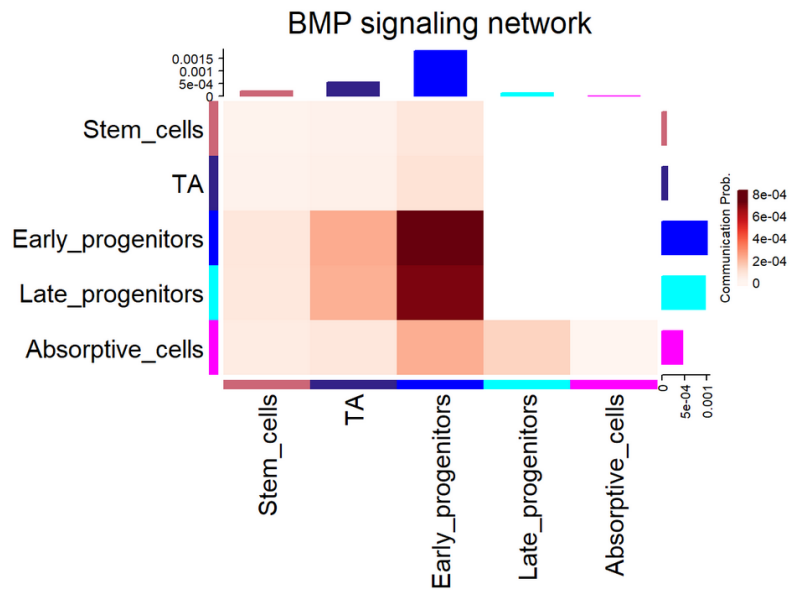
In vivo



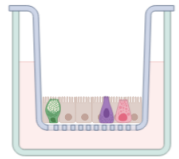


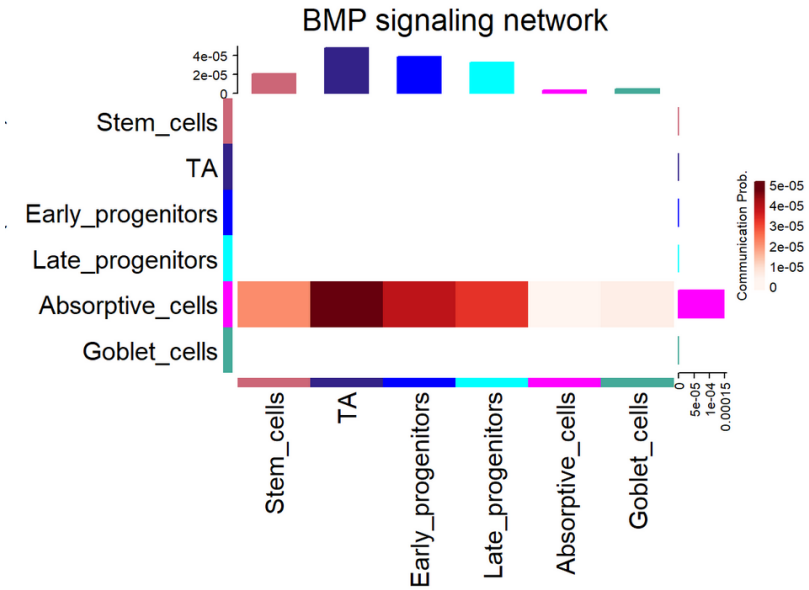
Culture immergée



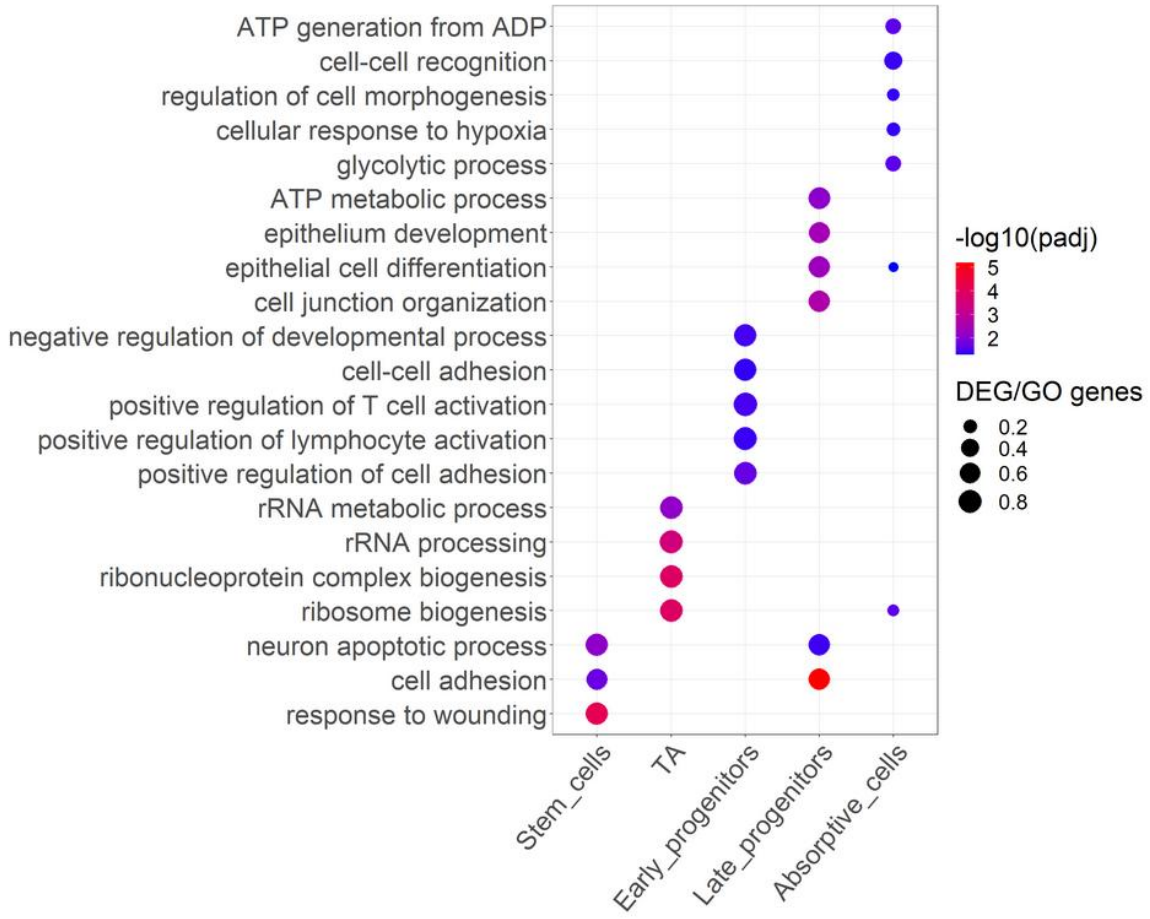


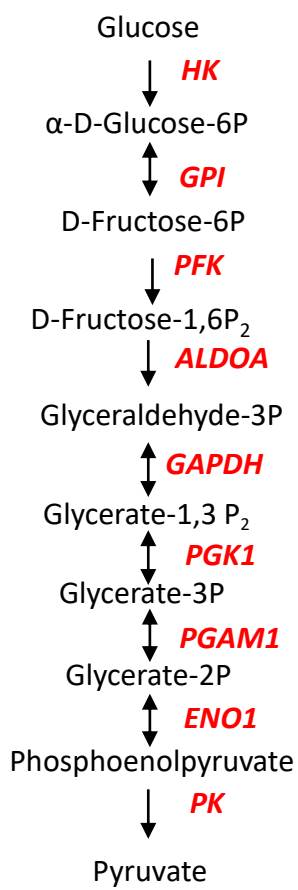
Culture en interface air-liquide

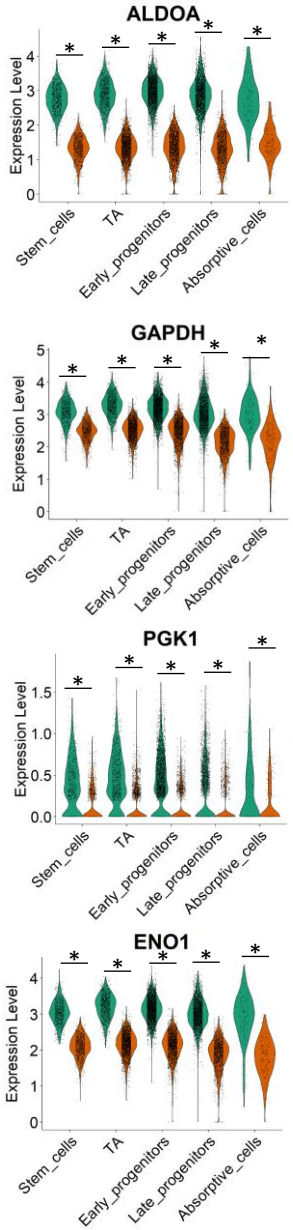




Effets des conditions de culture sur l'expression des gènes







Remerciements

GenPhySE

Equipe MUSE

Christelle Knudsen
Sylvie Combes
Claudia Vicente
Géraldine Pascal
Laurent Cauquil
Nathalie Marty-Gasset
Corinne Lencina
Manon Despeyroux
Agathe Juppeau

Tania Malonga
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Rémi Centrès
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Mathilde Rumeau
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PECTOUL

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