RESILIENS

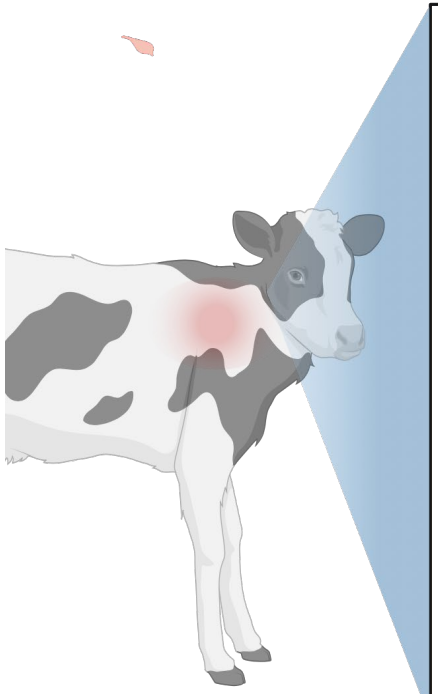
Impact of the respiratory microbiome-glycome interplay on the bovine susceptibility to infections

RESILIENS: partners

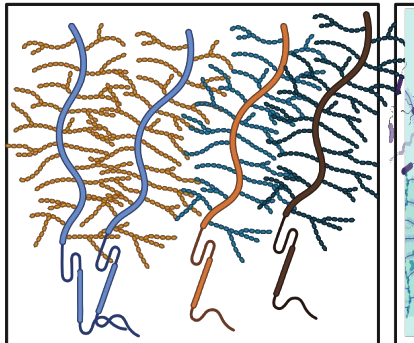
Partner	Nom Prénom	Dépt INRAE	Unité	Expertises
1	**Ducatez Mariette, Meyer Gilles**	SA	1225 IHAP, VIRéMIE	Virologie, pathologie des ruminants
2	**de Boyer des Roches Alice, Ledoux Dorothée**	Phase	UMR 1213 Herbivores	Comportement animal, santé et bien-être animal, douleur, outils de l'élevage de précision (capteurs)
3	**Mach Núria**, Citti Christine	SA	UMR 1225 IHAP, Myc-id	Microbiote
4	Loux Valentin	MICA- MathNum	UR 1404, groupe bioinformatique de Migale	Analyses bioinformatiques du microbiote
5	Doublet Benoit	MICA	UMR 1282 ISP	Resistome
6	Meynadier, Annabelle	Phase	UMR 1289 Genphyse	Analyse des acides gras chaine courte, microbiote, éthique
7	Yamakawa Nao	Plateforme d'Analyse des Glycoconjugués (PAGés), Faculté des Sciences et Technologies de Lille - UAR 2014 - INSERM US 41 PLBS, (UDL-CNRS-INSERM-CHU-IPL), CNRS		Glycomique
8		Plateforme GetPlage		Séquençage 16S rRNA + whole metagenome
9	Richard Eric	Labéo, Caen		biochimie

Context

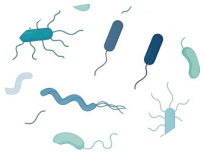
Discover the delicate dance against pathogens in the mucus: an emerging field



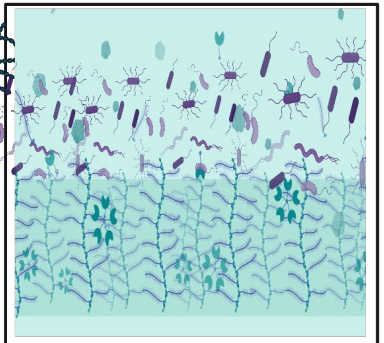
The bovine respiratory disease complex is a ubiquitous and prevalent pathobiotic system ranked as a high priority by the EU



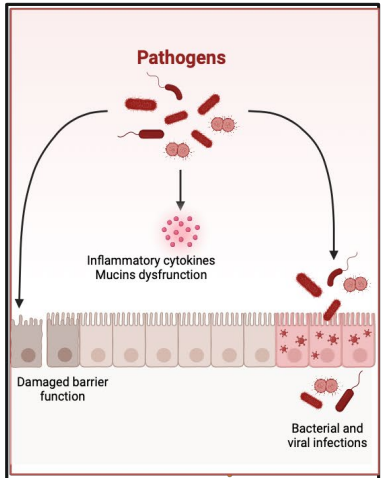
Mucins glycome: the guardians



The microbial orchestra

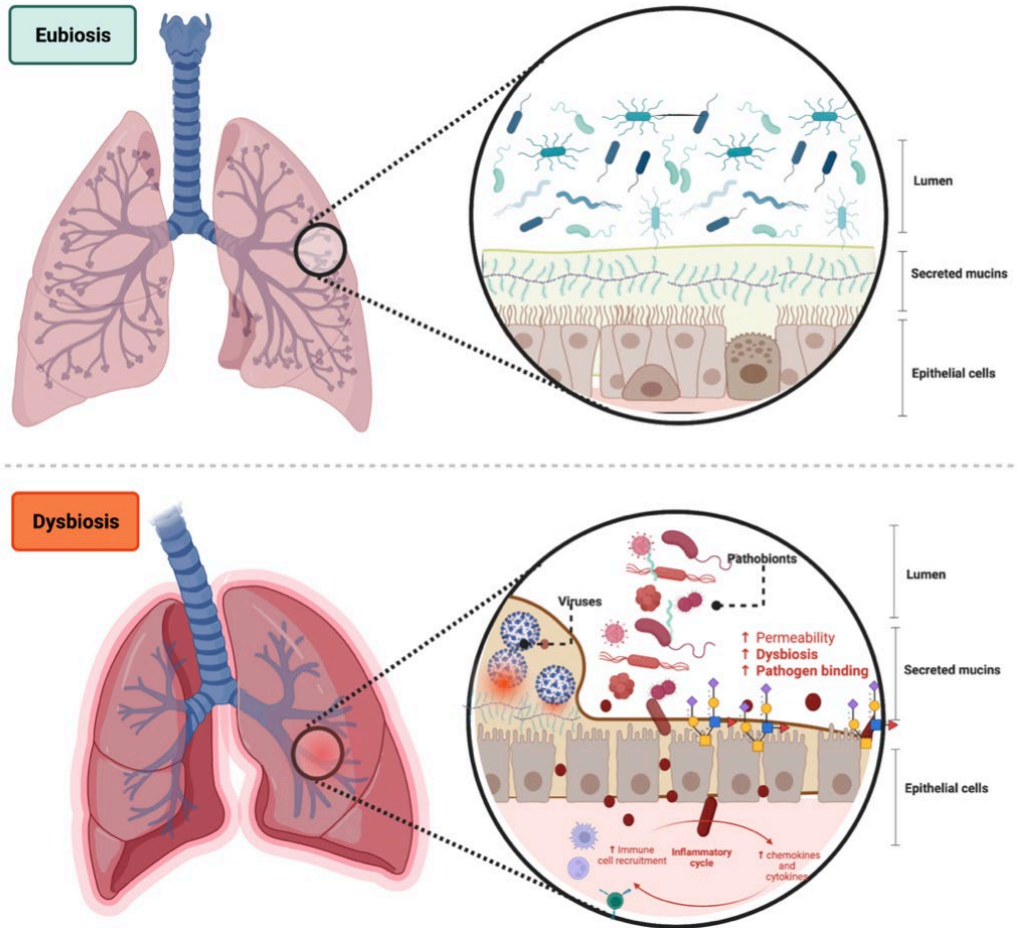


Delicate dance: Interplay mucins-microbiota in the mucus



When the dance falters:
Polymicrobial infections
Animal Health problem
Animal welfare problem
Massive use antibiotics

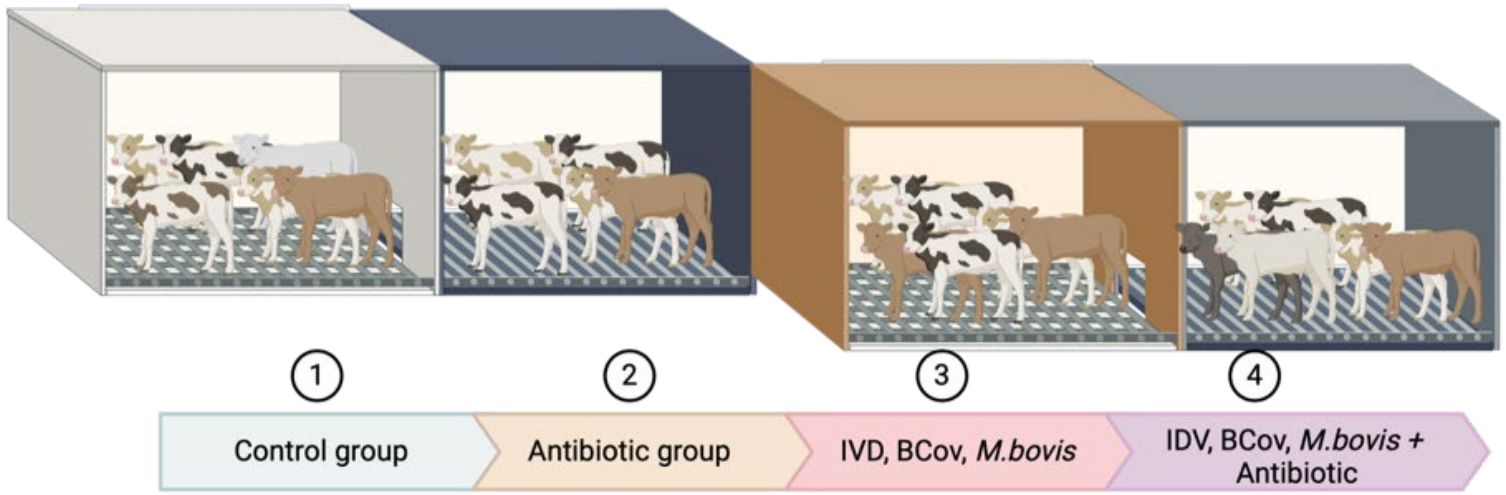
Hypothesis



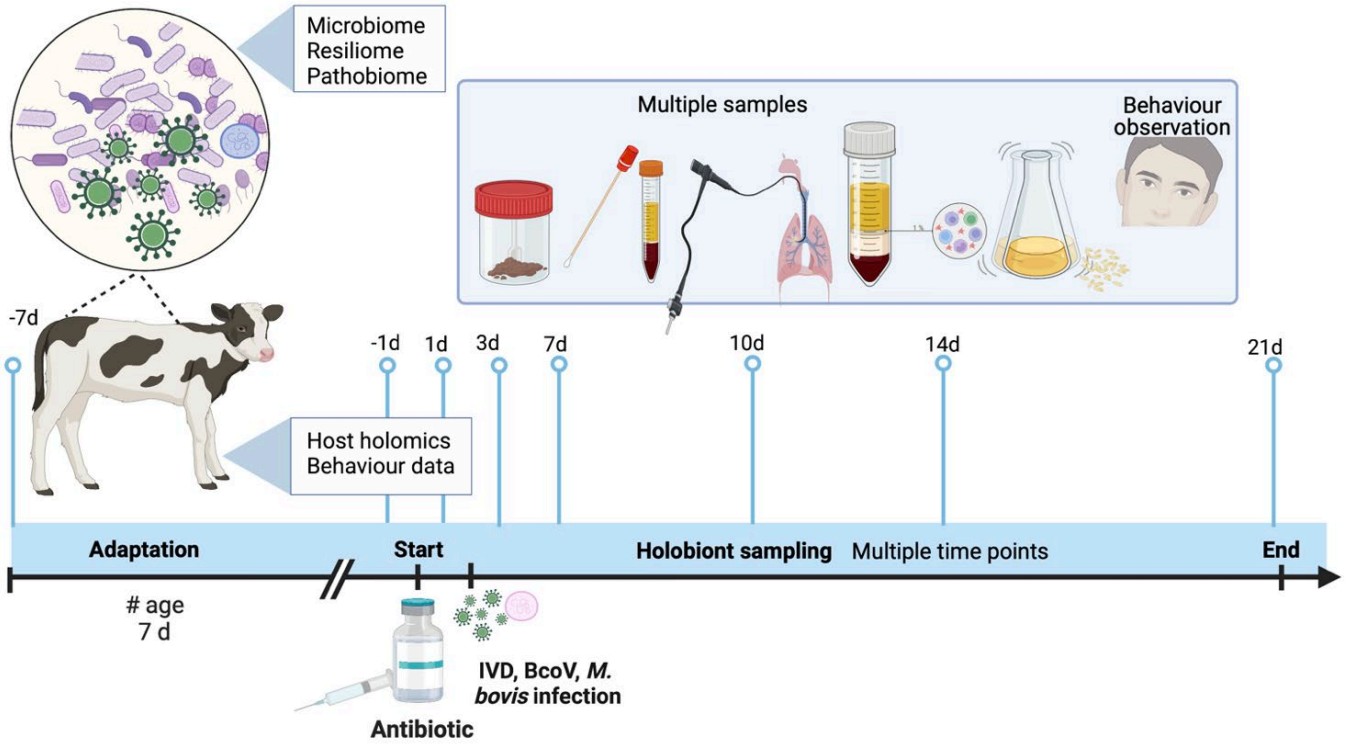
We hypothesize that disrupting the mucosal microbiome (e.g., via antibiotic administration) can change mucins' production and their glycans' glycosylation pattern. This will affect the mucosal barrier and functions, potentially increasing the risk of successful infection by pathogens.

In vivo protocol at the ENVT

- **28 calves (aged one week) negative for IDV, BCoV, and *M. bovis***
- ***Four*** groups:
  (i) untreated and co-infected with IDV, BCoV, and *M.bovis*
  (ii) treated with macrolide (tilmycosine, PO) and co-infected
  (iii) uninfected and treated with antibiotic
  (iv) uninfected and untreated



In vivo protocol at the ENVT: November/December 2024



- Sampling: Nasal swabs (NS), BALs, feces, blood samples: D-8, -1, 1, 3, 7, 9, 14, 19
  - microbiology, immune responses
  - Glycome, microbiote, nasal mucins' type ..
- Behavior and digital welfare measures from D-7 to D21
- Clinical evaluation from D-7 to D21

Thank you!

- First results to be expected early 2025!