

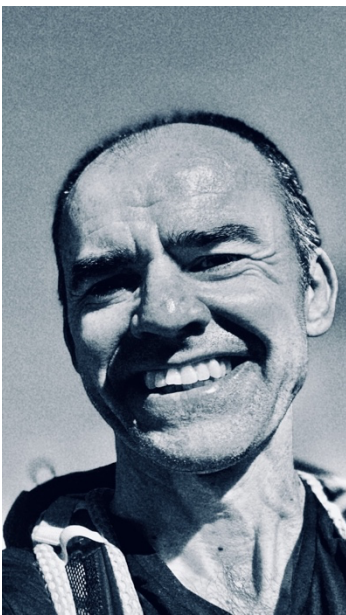
CRBM external seminar 2024  
Thursday, April 25th 11:00 am Salle Marcel Dorée

## The importance of being faithful

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Ignacio Bravo obtained a PhD Biology (Biochemistry and Molecular Biology) in 2002 at the University of León, Spain. He then moved to Heidelberg for a post-doc on cell differentiation at the German Cancer Research Center, and further to Munster as junior professor at the Institute of Evolutionary Biology. In 2008 he was back in Spain to work first on Genomics and Public Health, and then as head of the Infections and Cancer laboratory at the Catalan Institute of Oncology. He is now Director of Research at the CNRS and head of the *Perturbations, Infection, Virulence* department at the Laboratory MIVEGEC (Maladies Infectieuses et Vecteurs: Écologie, Génétique, Évolution et Contrôle) CNRS, UM, IRD.

A chemist and biochemist by training, he has acquired expertise in cellular virology, studying the evolution of genotypes and phenotypes in hosts and parasites. His interests lie in the alternative pathways of biological information flow from genome to transcriptome to proteome, that eventually condition the broad gradients connecting genotype to phenotype. Since every information transmission event is inherently imperfect, evolution is also dependent on the inevitability of biological noise. Ignacio would like to generate a large framework for understanding the origins and implications of

biological noise, and works specifically on phenotypic noise and noise in biomolecular functioning during long-term host-parasite interactions. He is also genuinely interested in the philosophy of science and worried by the trend towards systematic predation on the scientific system by the political and administrative instances on the one hand and by the publishing industry on the other hand.

### Abstract

Accurate information flow is central to living systems. The continuity of genomes through generations as well as reproducible functioning and survival of the individual organisms require a faithful information transfer during replication, transcription and translation. However, limits to improved fidelity exist, imposed by the physical nature of the processes of copying and recoding information over different molecular supports. There is growing evidence supporting the existence of pervasive transcriptional and translational diversity, leading to phenotypic plasticity.

I will focus for this presentation on fidelity during transcription and translation. I will present research and results on different experimental systems addressing the impact of codon usage preferences on i) alternative splicing; ii) translation of bicistronic mRNAs by human cells; and iii) protein synthesis and function. I will (try to) present an ordered and comprehensive view of the origin and implications of mistranscription and mistranslation for cell and organisms function, during ontogeny and across phylogeny.

### Selected publications

Contribution to Basic Science: translational selection.

Contribution to basic science: Coronavirus-related research during the pandemics

Contribution to Science and Society.

[The multi-level phenotypic impact of synonymous substitutions: heterologous gene expression in human cells](#) PMID: 36692287

[SARS-CoV-2 viral RNA levels are not 'viral load'](#). PMID: 34535373

[Protecting science in times of crises](#). PMID 36535630