Accessing the testicular germ cell secretome with "combinatorial omics": a major breakthrough in deciphering the germ cell-sertoli cell dialogue

Emmanuelle Com, F. Chalmel, Rene Lavigne, N. Hemio, L. Guillot, Ana Paula Teixeira, Jean-Louis Dacheux, Charles Pineau

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ACCESSING THE TESTICULAR GERM CELL SECRETOME WITH "COMBINATORIAL OMICS": A MAJOR BREAKTHROUGH IN DECIPHERING THE GERM CELL-SERTOLI CELL DIALOGUE

E. Com [1,*], F. Chalmel [2], R. Lavigne [1], N. Hernio [1], L. Guillot [1], A.-P. Teixeira [3], J.-L. Dacheux [3], C. Pineau [1]

[1]Proteomics Core Facility Biogenouest, [2]IRSET, Rennes, [3]UMR INRA-CNRS 6175, Nouzilly, France

Background: The complex structural organization of the mammalian testis creates particular difficulties for studying its organization, function, and regulation. Spermatogenesis that takes place in the seminiferous tubules is an intricate and specialized process whose control incorporates juxtacrine, paracrine and endocrine factor information, and is conditioned by the successive activation and/or repression of thousands of genes and proteins.
It has been yet established that germ cells modulate somatic Sertoli cell function via diffusible proteins. However, the impossibility to maintain germ cells in vitro makes it difficult to study their secretome. Interestingly, within the seminiferous tubules, germ cells and Sertoli cells are surrounded by the testicular fluid (TF), which probably contains factors involved in the germ cell-somatic cell crosstalk.

Methods: An innovative approach combining TF collection by microsurgery, fluid pre-fractionation, shotgun mass spectrometry and "combinatorial omics" was used to decipher and mine the rat and ram testicular fluids. Over 1400 non-redundant proteins were identified and their presence in TF was further correlated with the transcriptome of isolated testicular cells so as to confirm their cellular origin.

Results: Secreted proteins were identified and scored using the Secreted Protein Database. We demonstrate here that a subset of proteins is actively secreted by germ cells into the TF. Potential known partners of these germ cell-secreted proteins were proposed using protein network data available via certified public repositories and Sertoli cell proteins expressed on plasma membranes were selected for further studies. Coexpression of potential germ cell-Sertoli cell protein partners was validated by immunohistochemistry.

Conclusion: Here we identify novel interacting protein partners involved in the germ cell-Sertoli cell crosstalk. We also demonstrate that "combinatorial omics" is a powerful approach to characterize the testicular germ cell secretome that was so far technically inaccessible.

Disclosure of Interest: None Declared

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Human Proteome Organization C/O MCI Geneva - PCO - Rue de Lyon 75 - 1211 Geneva - Switzerland
Phone: +41 22 33 99 578 - Fax: +41 22 33 99 631 - Email: hupo2011@mci-group.com

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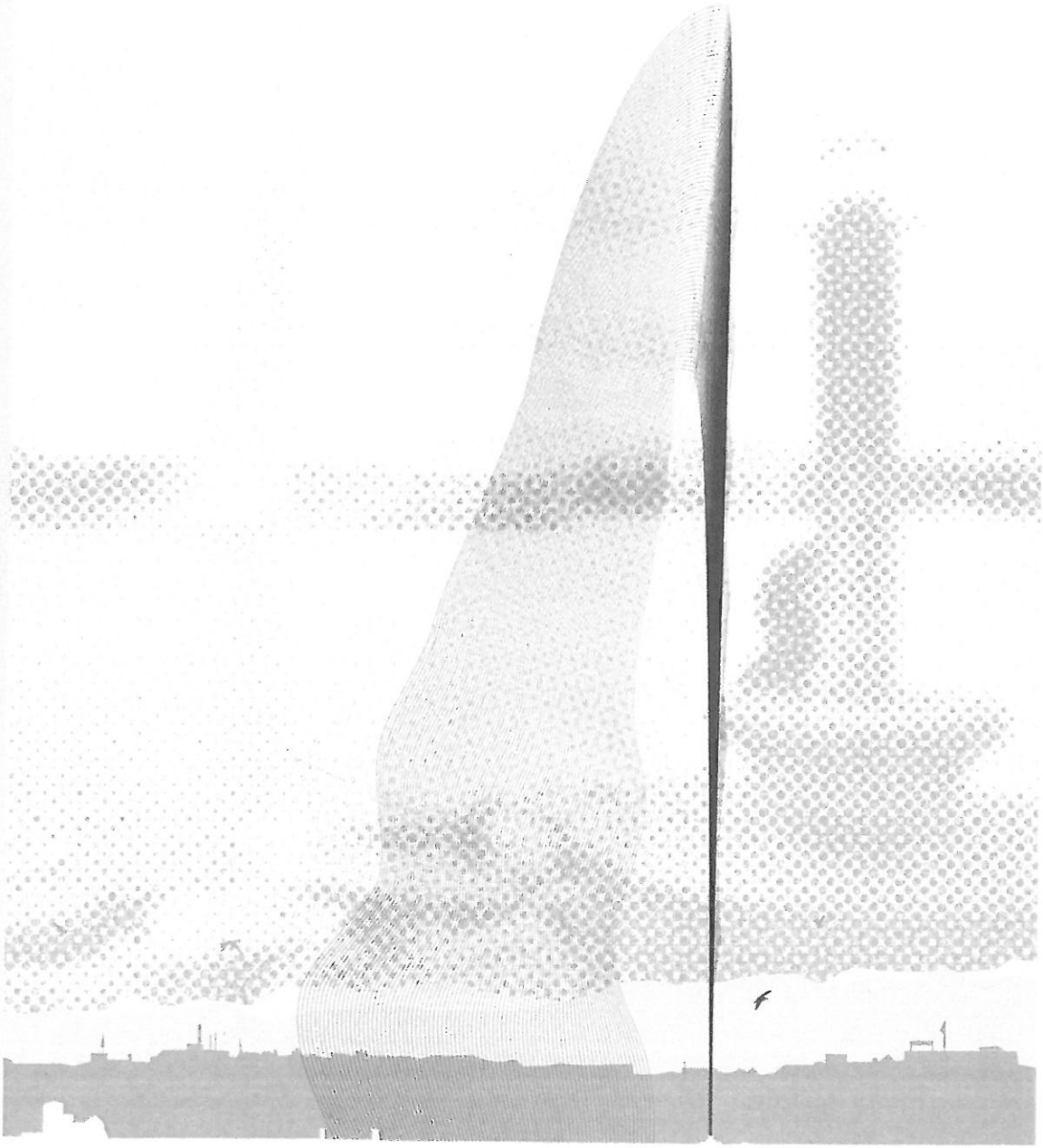

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