Unveiling the anti-Mycobacterium secrets of medieval remedies: advanced analytical approaches for a modern understanding

Capucine Braillon*[1,2], Anaïs Lannoy[1], Régine Janel-Bintz[2], Françoise Roquet-Banères[3], Laurent Kremer[3], Véronique Pitchon[4], Pierre Fechter[2], Catherine Vonthron-Sénécheau[1], and Sergio Ortiz[1]

[1]Laboratoire d'Innovation Thérapeutique – université de Strasbourg, Centre National de la Recherche Scientifique – France

[2]Biotechnologie et signalisation cellulaire – université de Strasbourg, Centre National de la Recherche Scientifique – France

[3]Institut de Recherche en Infectiologie de Montpellier – Centre National de la Recherche Scientifique, Université de Montpellier, Centre National de la Recherche Scientifique : UMR9004 – France

[4]Archéologie et histoire ancienne : Méditerranée - Europe – université de Strasbourg, Centre National de la Recherche Scientifique – France

Résumé

The recent proliferation and prevalence of antimicrobial multi-resistant infections has prompted the development of other strategies and alternatives to urgently combat this global threat. Rifampicin-resistant *Mycobacterium tuberculosis* was included in the Critical Priority class of pathogens defined by the World Health Organization, due to the global impact on public health, the severity of the disease on affected patients and the increasing incidence of multi-drug-resistant strains (1-2).
In this context, past mastering of remedies formulation appears as a wealth of resources for present research. In particular, Arab Medieval Pharmacopeias (AMP) were explored by our interdisciplinary team gathering researchers from biology, chemistry, humanities and informatics sciences (3) with the aim to discover new bioactive compounds from ancient preparations to combat actual health threats.

Modern approaches were conducted together for the selection a remedy from AMP, the targeting of potential antimicrobial compounds and their isolation. Three manuscripts from the 9th to the 12th Century were used to create an interactive database in order to bring out relevant anti-tuberculosis remedies (4). A formulation assembling plants resins, roots and metals was highlighted. After sourcing, extraction and in vitro evaluation against *Mycobacterium tuberculosis* H37Rv, five resins extracts showed anti-*Mycobacterium* activity (MIC values from 100 to 400 μg/mL). The study was then focus on Bdellium, a gum-resin from *Commiphora wightii* (Burseraceae) based on its selective action against *M. tuberculosis* strain. The targeted isolation of putatively bioactive compounds was guided by the combination of HPLC-HRMS/MS data dereplication and molecular networking, both with pharmacophoric deconvolution which is differential analyses of 2D NMR data linked to bioactivity. Pharmacophoric deconvolution indicates that diterpenes structural pattern could be responsible

*Intervenant

of the anti-*Mycobacterium tuberculosis* activity. Their targeted isolation and antimicrobial evaluation are ongoing to confirm our analytical and historical approaches.

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Mots-Clés: Resin, anti Mycobacterium, Molecular Networking, Pharmacophoric deconvolution