

A modular approach to multiscale modeling of the innate immune response to invasive aspergillosis

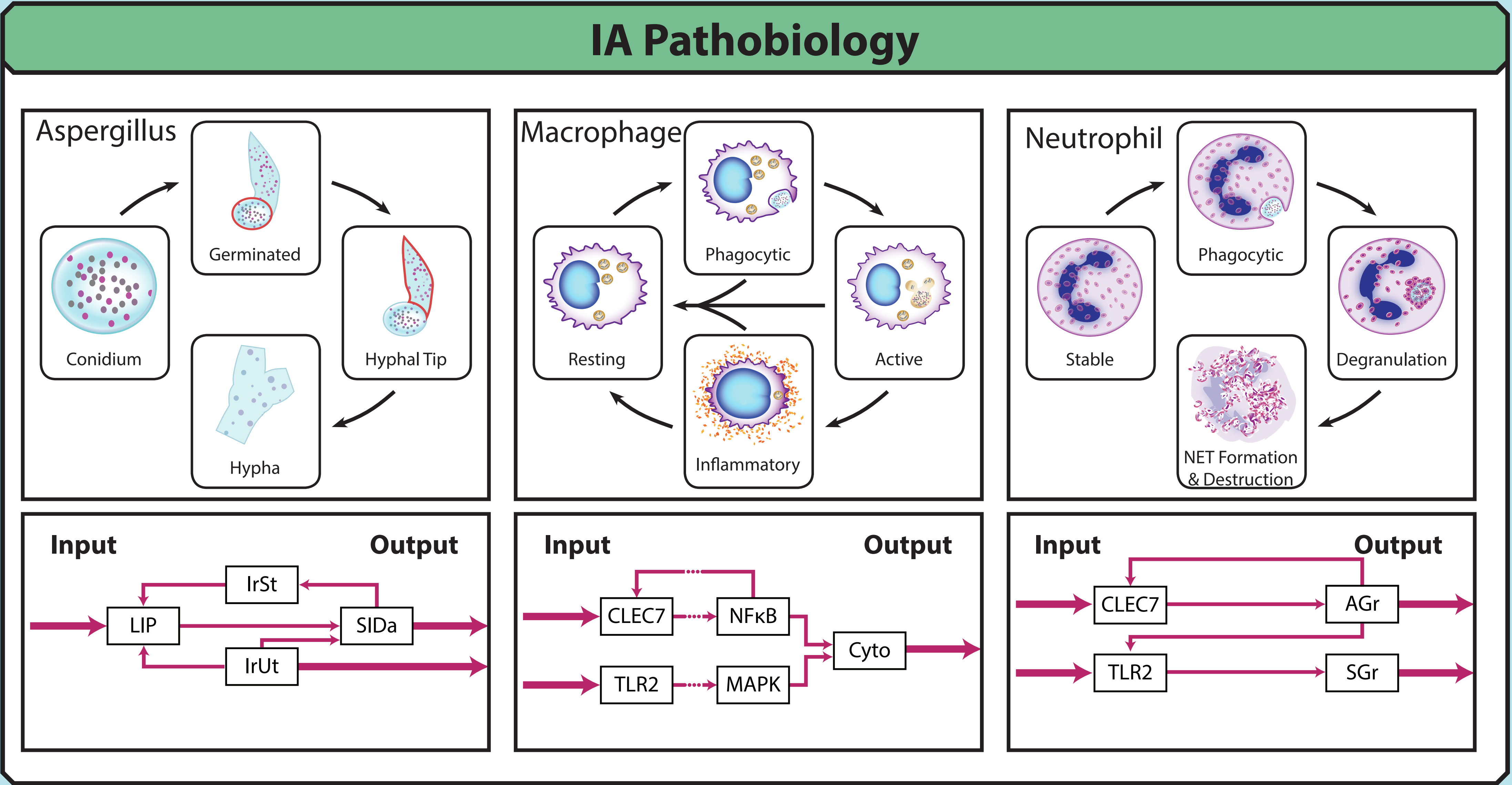
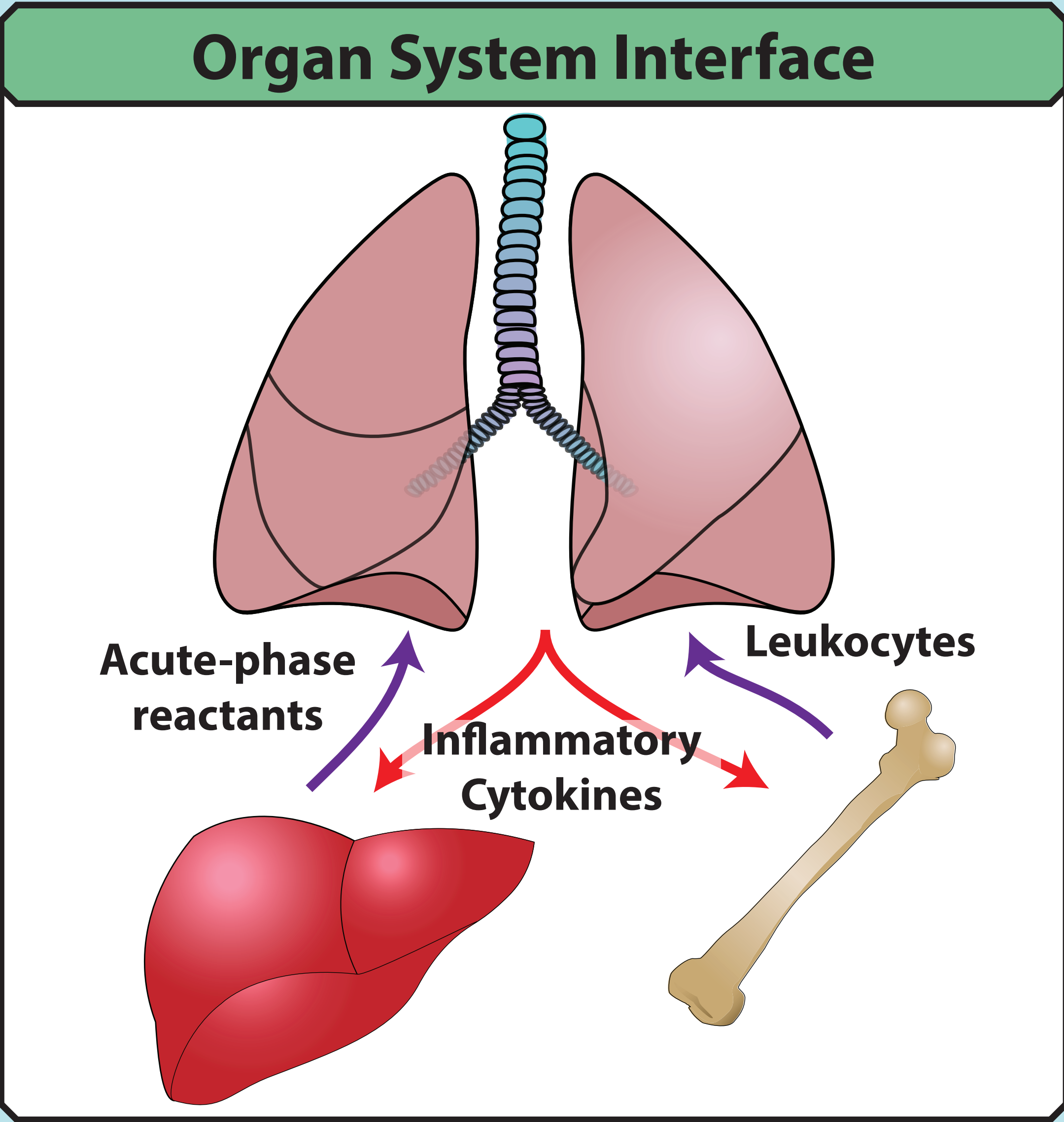


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Introduction

Invasive aspergillosis (IA) is a deadly opportunistic fungal infection in immunocompromised populations. Current treatments focus primarily on the fungus, but in recent years approaches have been explored that aim at strengthening the host's immune response. Relevant mechanisms span several spatial scales, ranging from intracellular network responses to systemic features. The biological aim of this project is to explore host-centric therapeutics with the help of a multi-scale computational model. At the same time, we aim to develop novel software design principles that make the model extensible, reproducible, and usable by non-modelers.



Project Highlights

- Novel modeling tool for fungal respiratory infections
- Integration of high-throughput molecular data with tissue and whole-body data from a mouse model
- Novel modular model design using containerization
- Visualization tool making model accessible to non-modelers
- Model reproducibility through integrated computational environment
- Interdisciplinary team, including mathematicians, software engineers, pulmonary and critical care physicians, and scientific visualization experts

