Contribution ID: **82** Type: **Poster Presentation**

Differential priming and tolerance of monocytes challenged with external stimuli

Monday, 9 July 2018 19:45 (15 minutes)

Cellular adaptation to varying signal strengths has been observed in the innate immune cells responses to external and internal challenges. Monocytes persistently challenged with low levels of external stimulants, can be skewed into a low-grade 'primed' state, while persistent challenges with high levels of external stimulants will skew them into to a 'tolerant' state. Based on experimental and modelling studies, we have identified a generic network motif, composed of mutually competitive signals, as a potential principle for bistable and/or intermediate priming and tolerance responses. We use analytical and numerical techniques to identify the detailed mechanisms for the activation magnitude, duration, and potential transition between priming to tolerant states.

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Session Classification: Poster Session

Track Classification: Biochemistry and Cell Biology