A Kappa model for hepatic stellate cells activation by TGFB1

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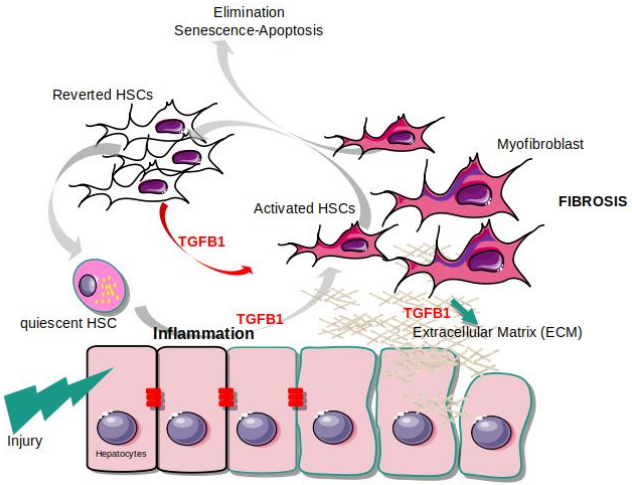
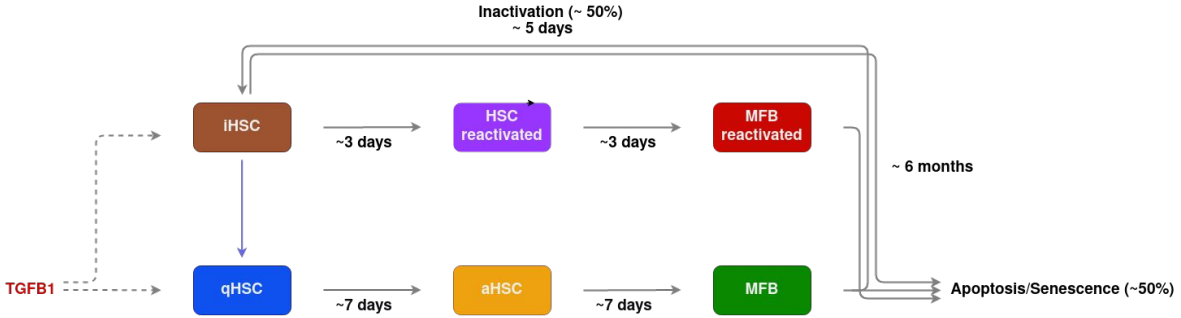
Hepatic Stellate Cells ; the drivers of tissue repair and fibrosis



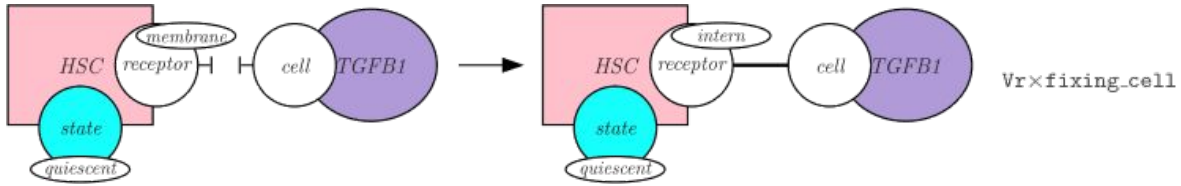


Kappa

Rule-based language for modeling systems of interacting agents (https://kappalanguage.org/)

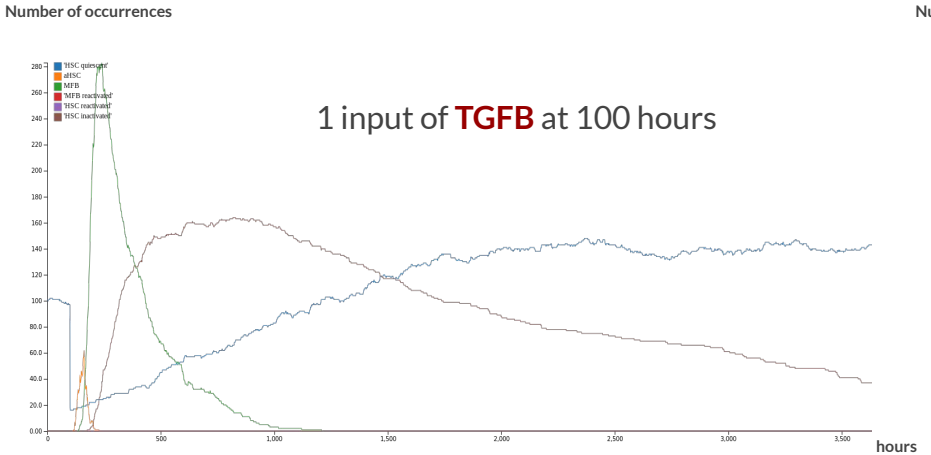
Entities are graphical structures, rules are graph-rewrite directives.

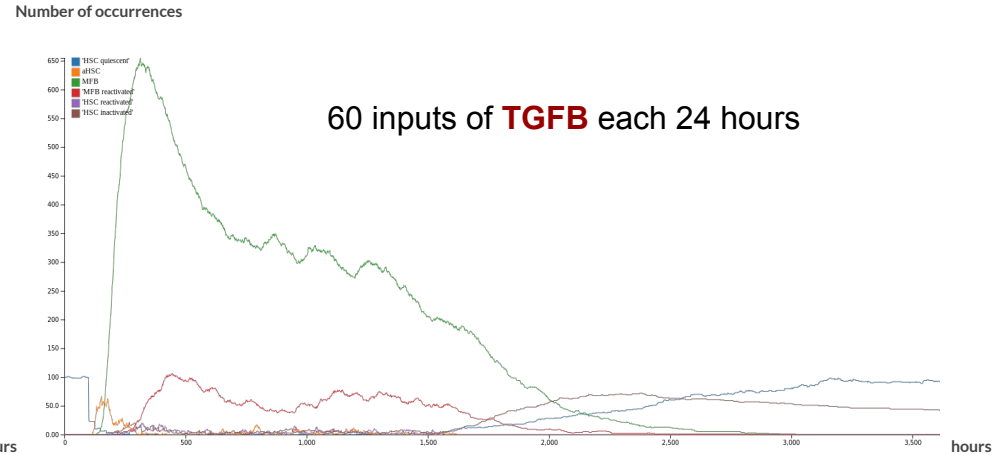
Rules locally modify the state of a system



*'HSC(state{quiescent} TGFBR1_2{membrane}[.]), TGFB1(cell[.], state{active}) -> HSC(state{quiescent} TGFBR1_2{intern}[1]), TGFB1(cell[1] state{active}) @ 'Vr' * 'fixing_cell'*

Acute simulation



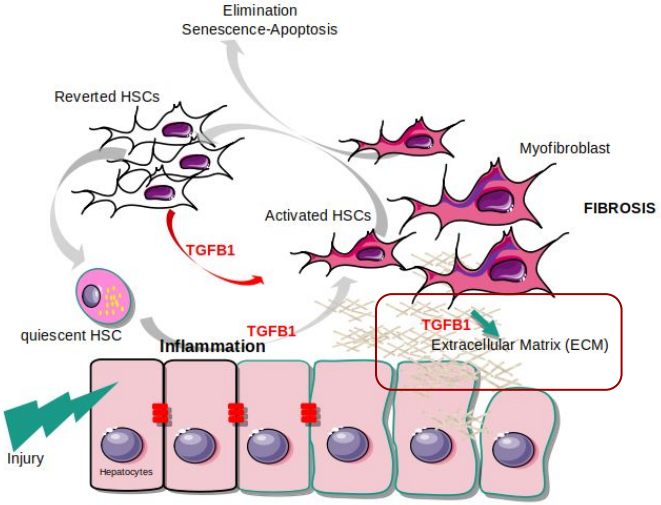


Conclusion

- reverted HSC (iHSC) are key regulators
- **TGFB1** is necessary to induce HSC activation but doesn't allow to reach a fibrotic state characterised by persistent high level of MFB

Hypothesis ; extracellular matrix contribute to the sustained activation of HSCs ?

A New model to develop !



Thank you for your attention