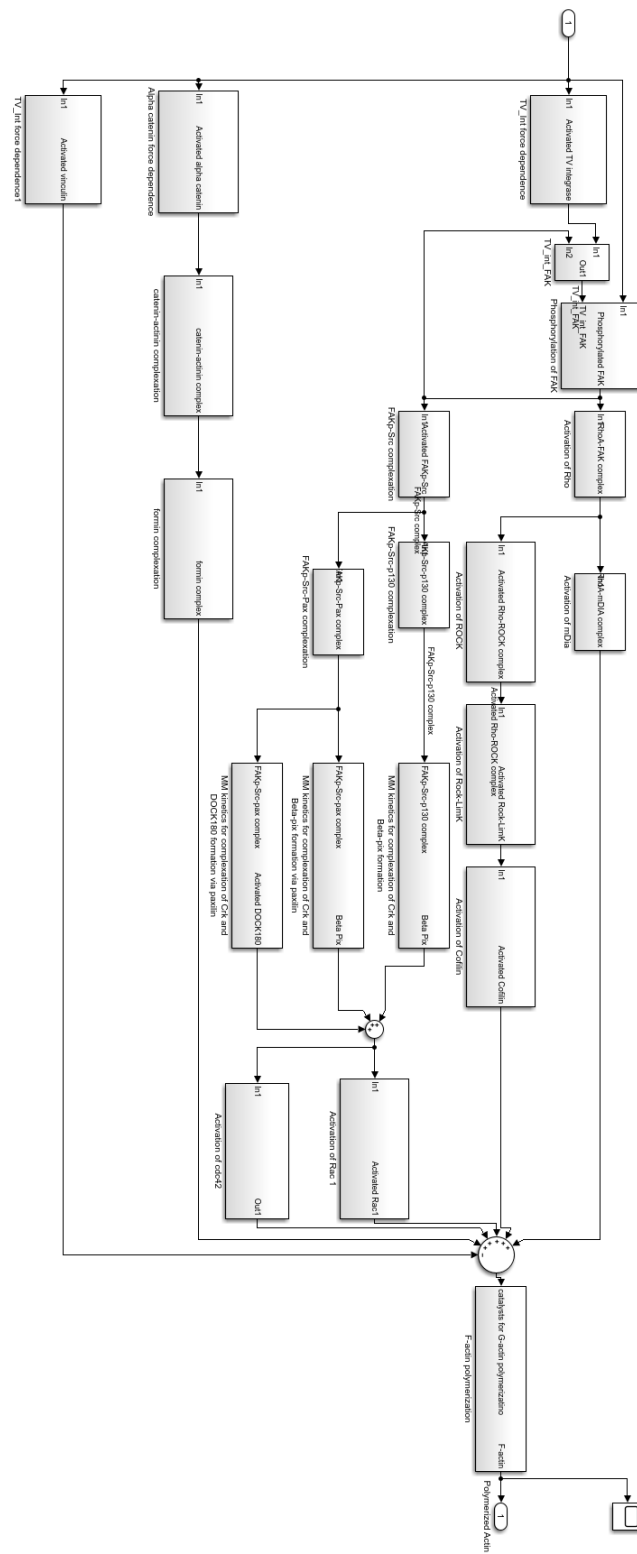
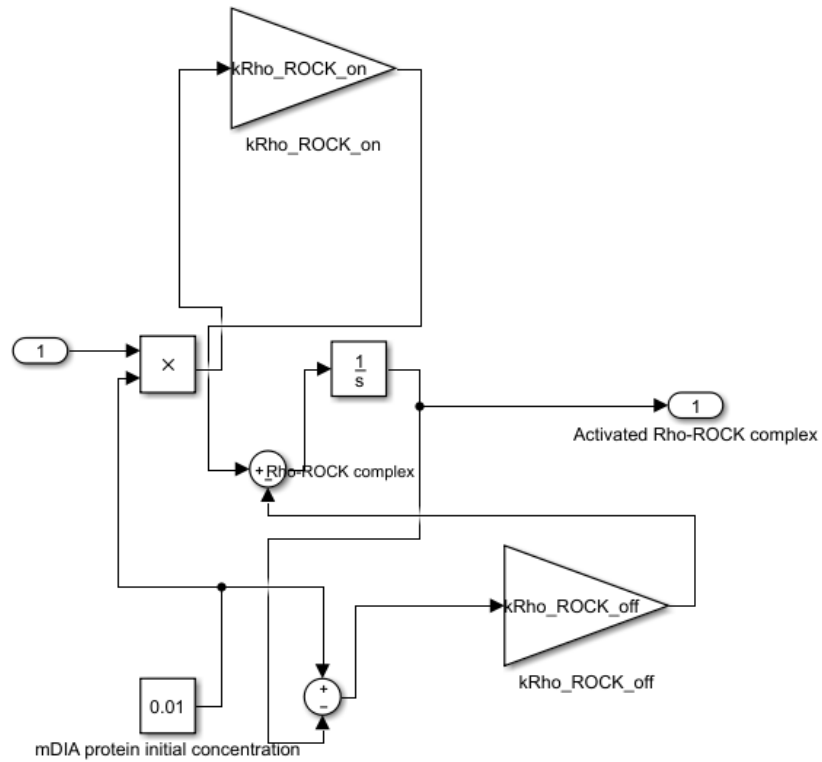


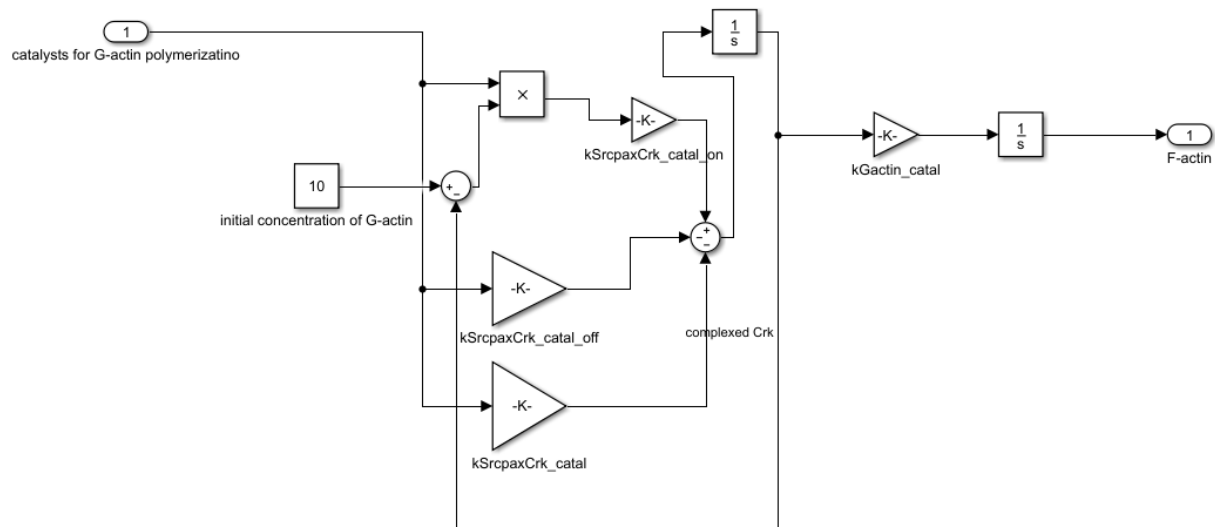
## Simulink Diagram of signaling cascade



## An example node applying the Michaelis-Menten model

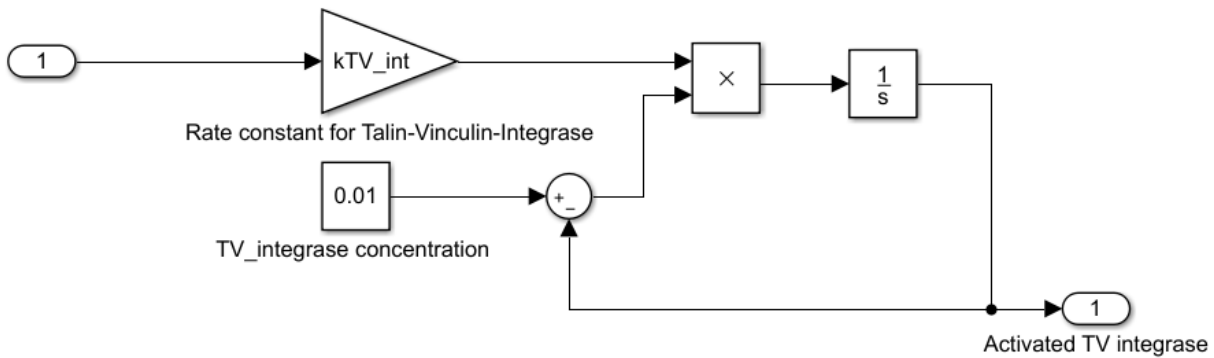


## An example node applying the Michaelis-Menten model for catalysis



## Implementation of mechano-transduction.

The activation of mechanosensitive proteins was simply modeled with a rate constant, the magnitude of the force and the concentration of the protein.



## List of parameters used in the model;

|                |                        |
|----------------|------------------------|
| kTV_int        | kDOCK_Rac1_on          |
| kTV_FAK_on     | kDOCK_Rac1_off         |
| kTV_FAK_off    | kF_cat                 |
| kPh_FAK        | kCat_act_on            |
| kFphos         | kCat_act_off           |
| kFAK_Rho_on    | kCat_vin_on            |
| kFAK_Rho_off   | kCat_vin_off           |
| kRho_mDIA_on   | kCatvin_form_on        |
| kRho_mDIA_off  | kCatvin_form_off       |
| kRho_ROCK_on   | kF_vin                 |
| kRho_ROCK_off  | kRhomDia_catal_on      |
| kRlimK_on      | kRhomDia_catal_off     |
| kRlimK_off     | kRhomDia_catal         |
| kLim_cof_on    | kROCKLimKcof_catal_on  |
| kLim_cof_off   | kROCKLimKcof_catal_off |
| kFAK_Src_on    | kROCKLimKcof_catal     |
| kFAK_Src_off   | kSrcp130Crk_catal_on   |
| kSrc_p130_on   | kSrcp130Crk_catal_off  |
| kSrc_p130_off  | kSrcp130Crk_catal      |
| kBeta_Rac1_on  | kSrcpaxCrk_catal_on    |
| kBeta_Rac1_off | kSrcpaxCrk_catal_off   |
| kSrc_pax_on    | kSrcpaxCrk_catal       |
| kSrc_pax_off   | kPoly_catal_on         |
| kBeta_cdc_on   | kPoly_catal_off        |
| kBeta_cdc_off  | kPoly_catal            |

## Final List of parameters;

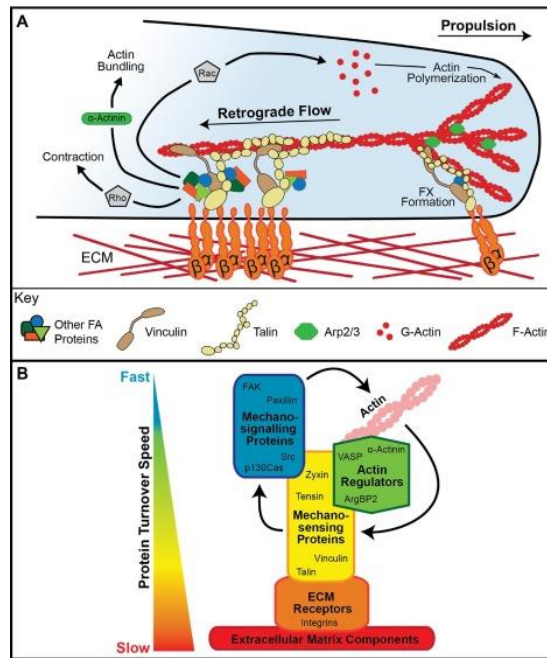
|                |          |
|----------------|----------|
| kTV_int        | 1        |
| kTV_FAK_on     | 0.999928 |
| kTV_FAK_off    | 0.997168 |
| kPh_FAK        | 0.999943 |
| kFphos         | 0.999424 |
| kFAK_Rho_on    | 0.999204 |
| kFAK_Rho_off   | 0.998405 |
| kRho_mDIA_on   | 0.988179 |
| kRho_mDIA_off  | 0.968371 |
| kRho_ROCK_on   | 1.000186 |
| kRho_ROCK_off  | 1.000256 |
| kRlimK_on      | 0.999648 |
| kRlimK_off     | 0.999192 |
| kLim_cof_on    | 0.988553 |
| kLim_cof_off   | 0.968567 |
| kFAK_Src_on    | 0.922809 |
| kFAK_Src_off   | 0.775739 |
| kSrc_p130_on   | 1        |
| kSrc_p130_off  | 1        |
| kBeta_Rac1_on  | 0.991262 |
| kBeta_Rac1_off | 0.9377   |
| kSrc_pax_on    | 0.869307 |
| kSrc_pax_off   | 0.592254 |
| kBeta_cdc_on   | 0.991262 |
| kBeta_cdc_off  | 0.9377   |

|                          |          |
|--------------------------|----------|
| kDOCK_Rac1_on            | 1        |
| kDOCK_Rac1_off           | 1        |
| kF_cat                   | 1        |
| kCat_act_on              | 0.999657 |
| kCat_act_off             | 0.999204 |
| kCat_vin_on              | 1        |
| kCat_vin_off             | 1        |
| kCatvin_form_on          | 0.98856  |
| kCatvin_form_off         | 0.968565 |
| kF_vin                   | 1        |
| kRhomDia_catal_on        | 1        |
| kRhomDia_catal_off       | 1        |
| kRhomDia_catal           | 1        |
| kROCKLimKcof_catal_on    | 1        |
| kROCKLimKcof_catal_off   | 1        |
| kROCKLimKcof_catal       | 1        |
| kSrcp130Crk_catal_on     | 0.999815 |
| kSrcp130Crk_catal_off    | 1.178172 |
| kSrcp130Crk_catal        | 0.873918 |
| kSrcpaxCrk_catal_on      | 0.99944  |
| kSrcpaxCrk_catal_off     | 1.356324 |
| kSrcpaxCrk_catal         | 1.058469 |
| kPoly_catal_on           | 1        |
| kPoly_catal_off          | 1        |
| kPoly_catal              | 1        |
| kGactin_on               | 1.000086 |
| kGactin_off              | 9.004085 |
| kGactin_cata             | 1.053028 |
| kSrcPaxCrk_DOCK180_catal | 0.701826 |

## Signaling Pathways modeled;

### Focal Adhesion pathway

Jansen et. al (2017)



### E-cadherin pathway

Huveneers et. al (2013)

