

Communication, Coordination, and Control in Neuromuscular Systems: IRG2, Drosophila Studies

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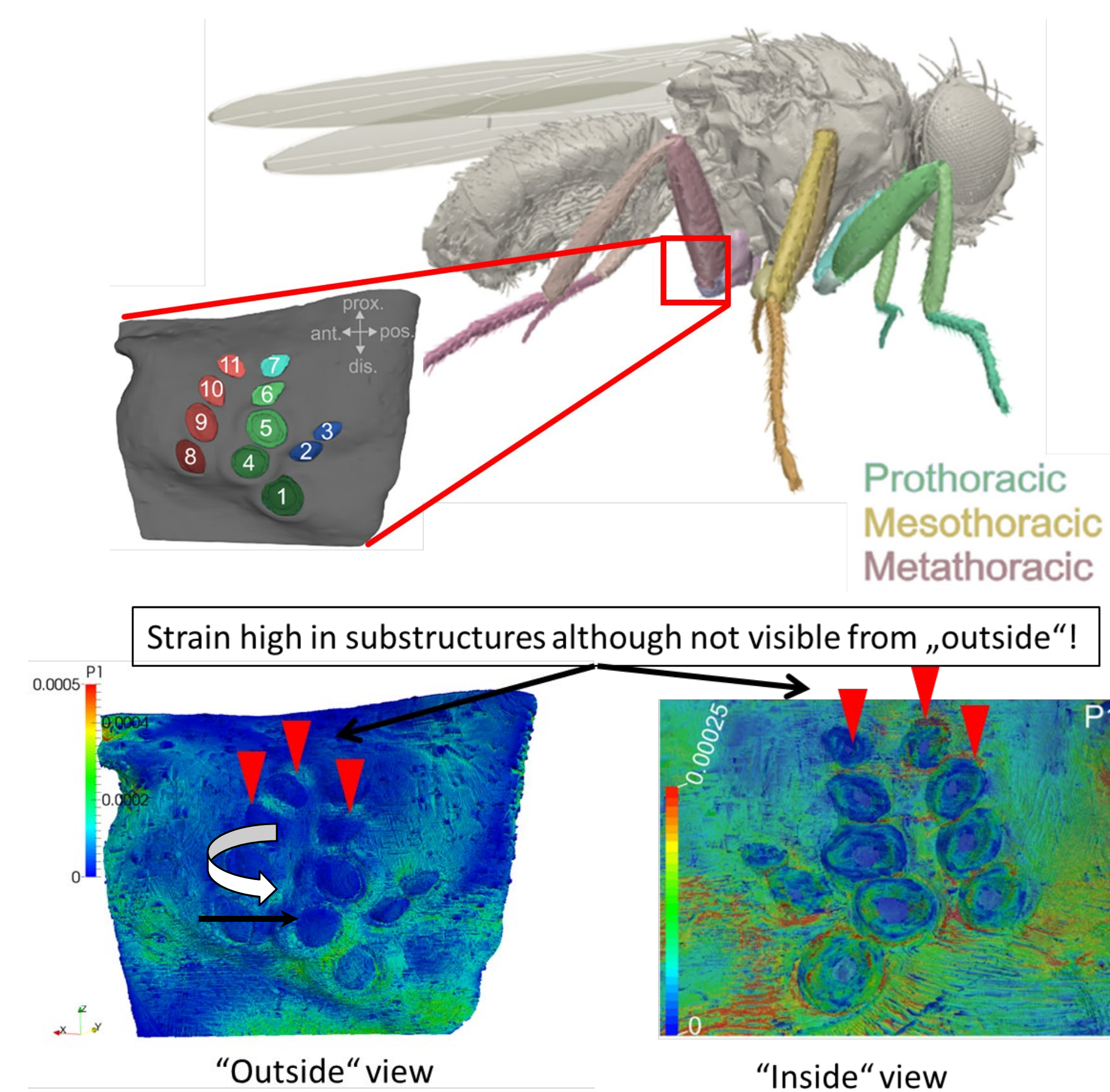
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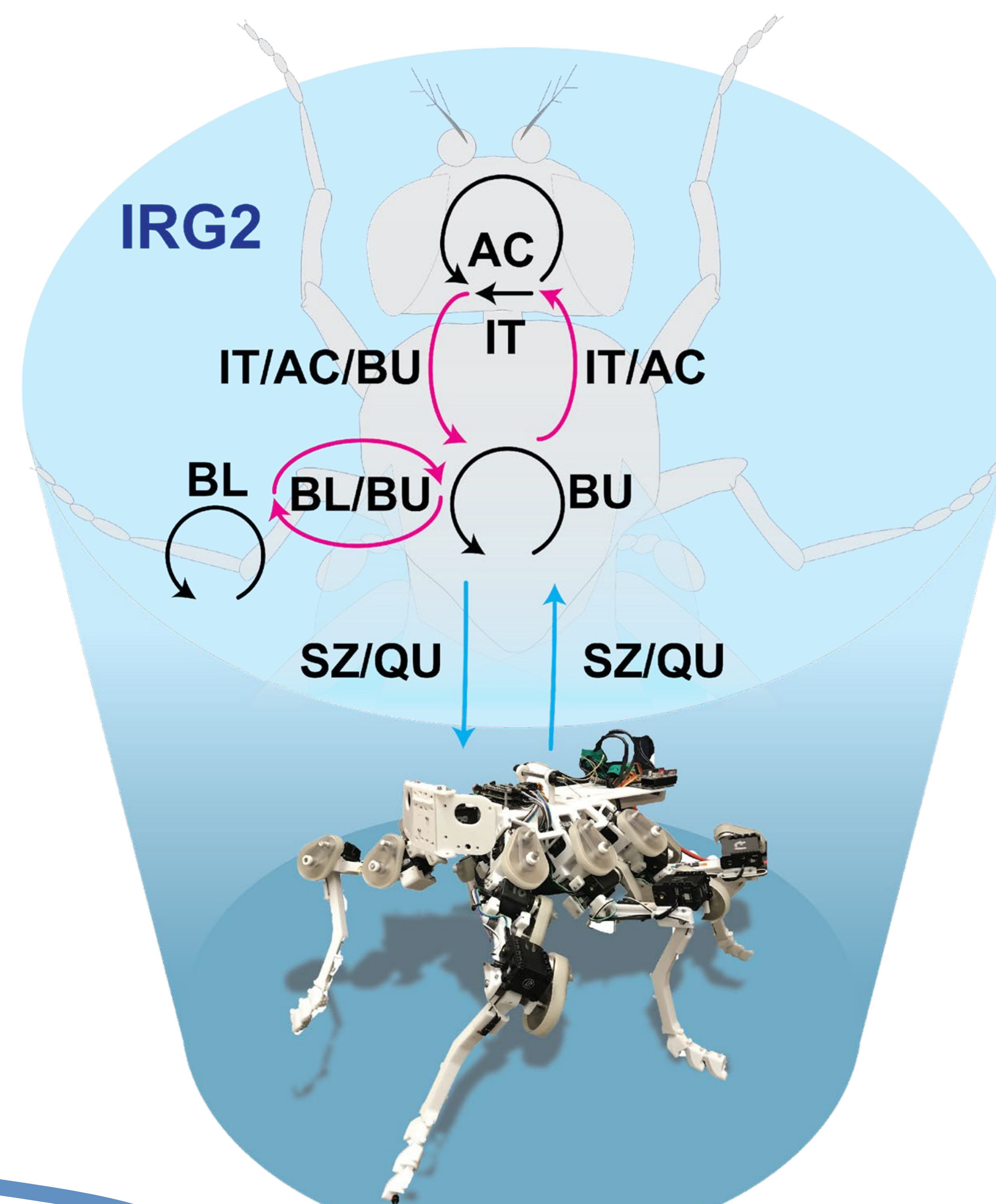
Blanke Lab (BL)

Measure and model the morphology and locations of mechanoreceptors on the legs

- High-res FEA shows that substructures influence strain levels around CS
- CS interconnection appears relevant for signal transduction
- CS variation within Drosophila and beyond
- Publ.: Dinges et al. 2021, Dinges et al 2022

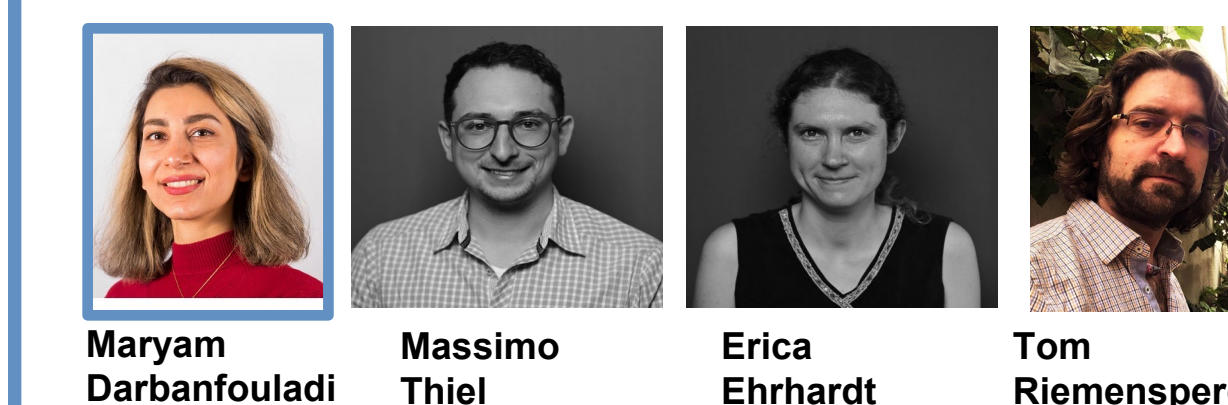
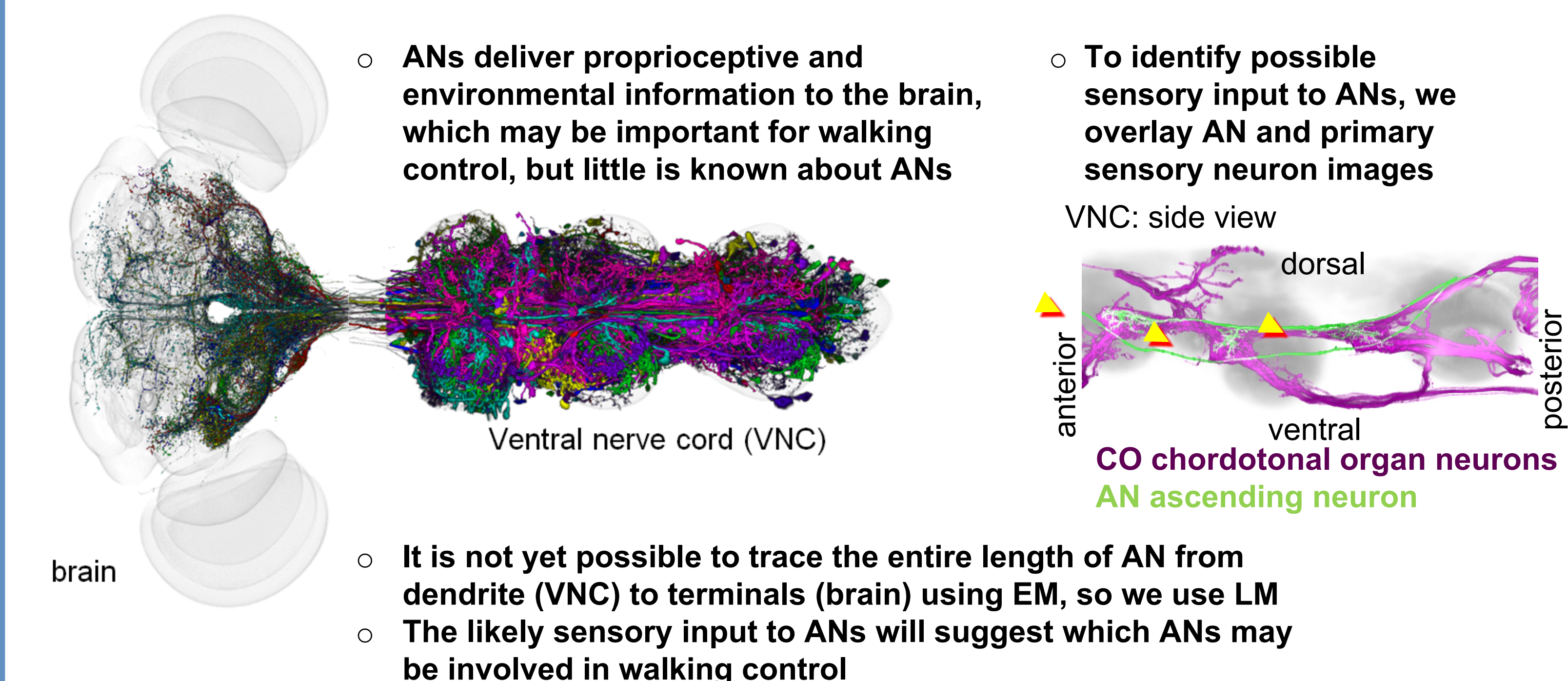


Brian Saltin



Ito Lab (IT)

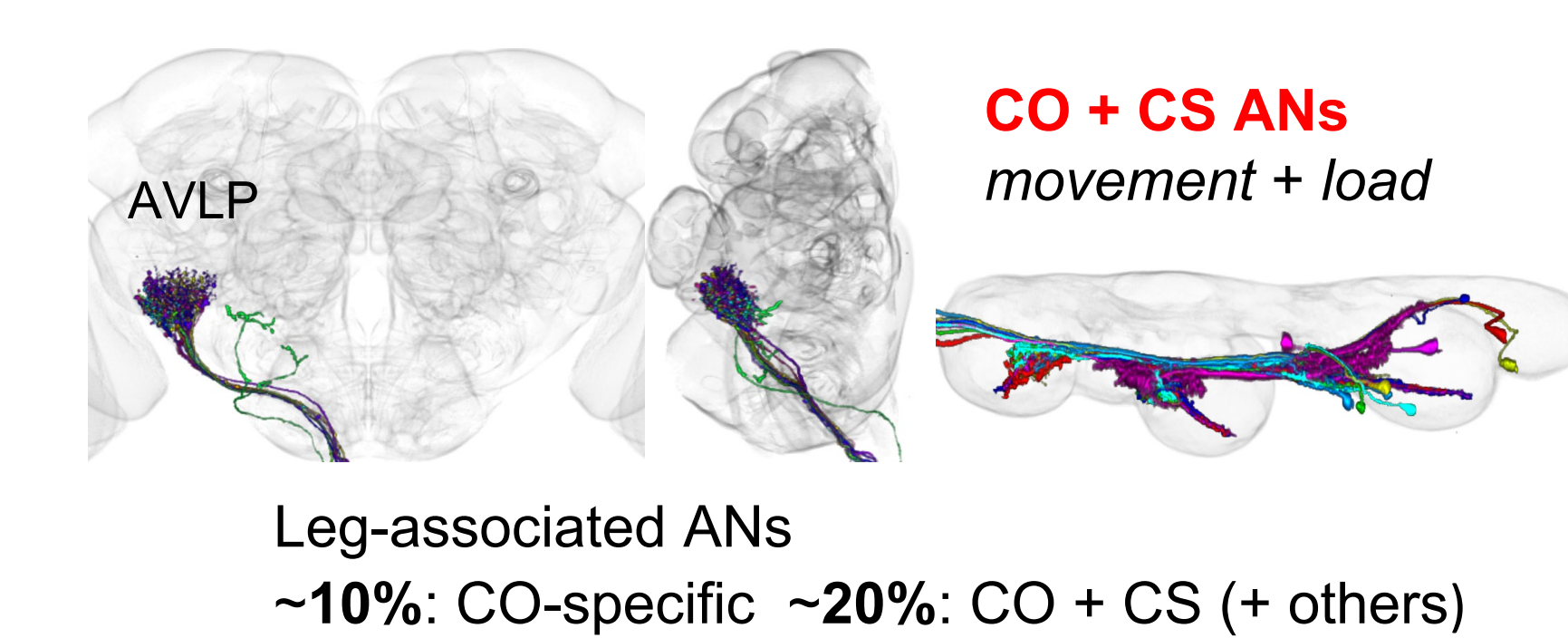
The role of ascending neurons (ANs) in controlling walking



Conclusion: The anterior ventral part of the Anterior Ventrolateral Protocerebrum (AVLP) likely receives and integrates ascending leg proprioceptive signals

Next goal: identifying downstream connections in the brain

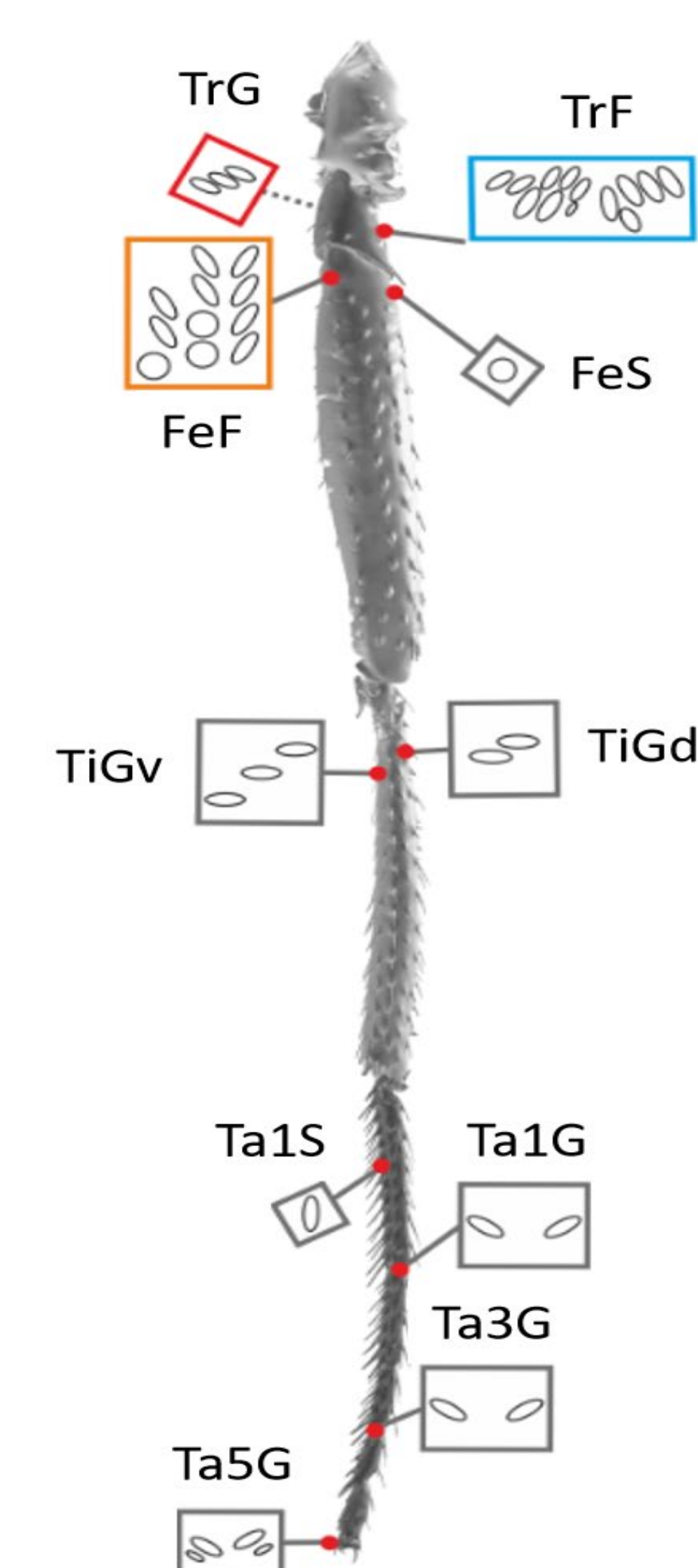
Targets of leg movement (Chordotonal Organ - CO) and load (Campaniform Sensilla - CS) signals



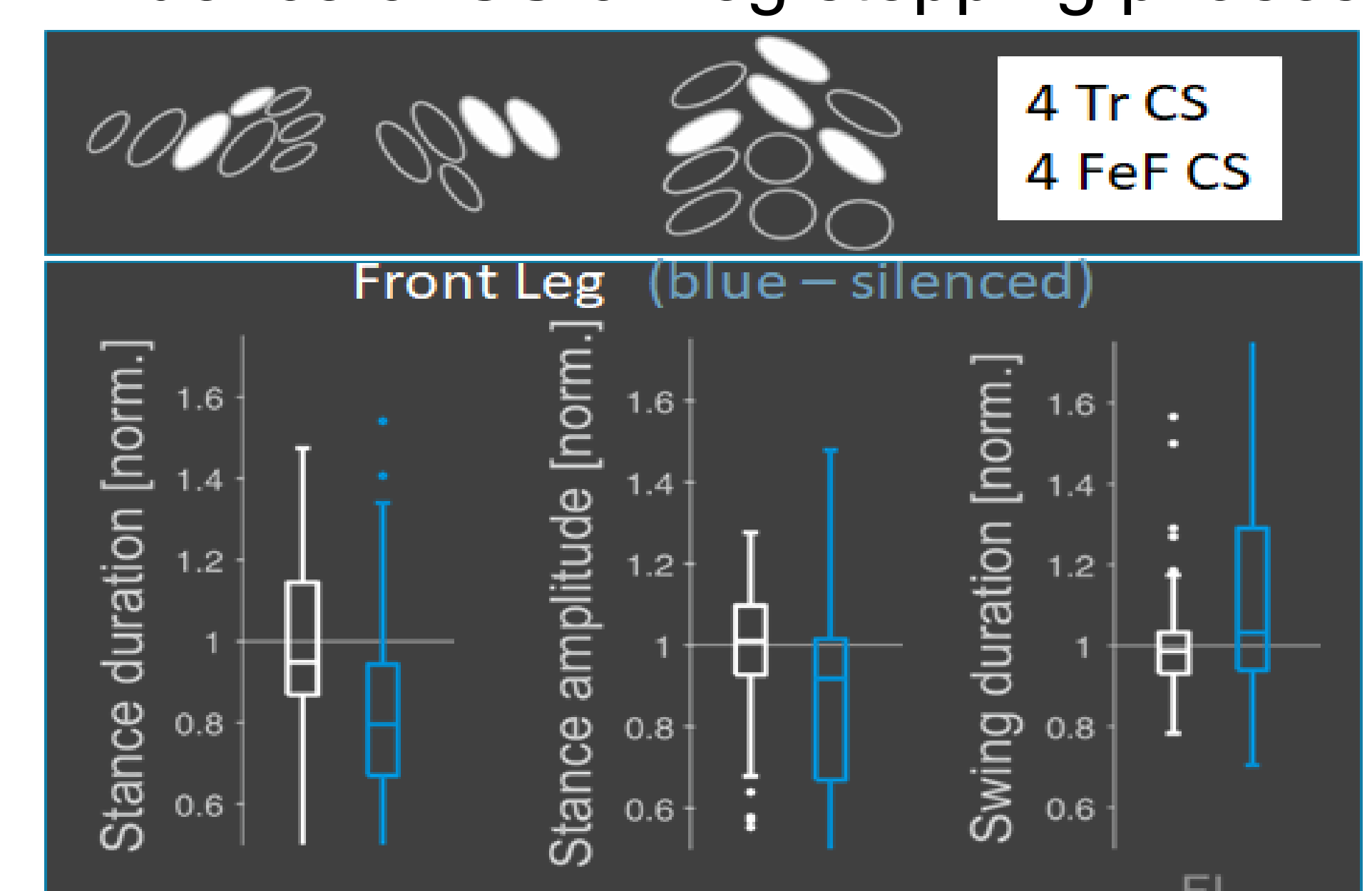
Büschges Lab (BU)

Role & processing of load feedback for stepping motor output

CS location



Influence of CS on leg stepping phases



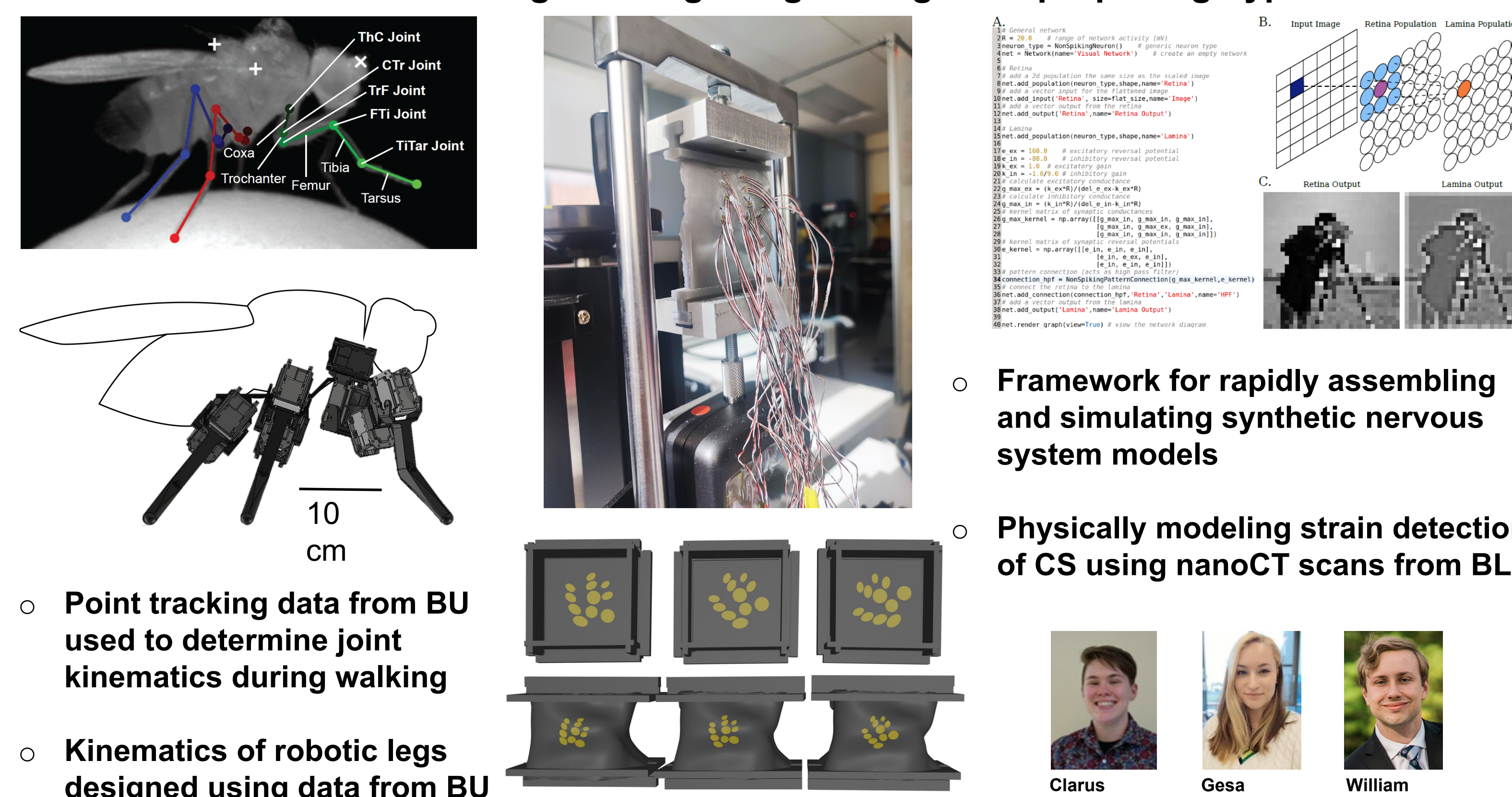
- +/- 42 CS on each leg at 10 diff. locations in groups or single
- 11 sparse split Gal4 lines that only label leg CS, mostly specific for FeF and TrF
- Studying CS-feedback for leg stepping by means of optogenetics

Publ.: Dinges et al. 2021; Dinges 2021

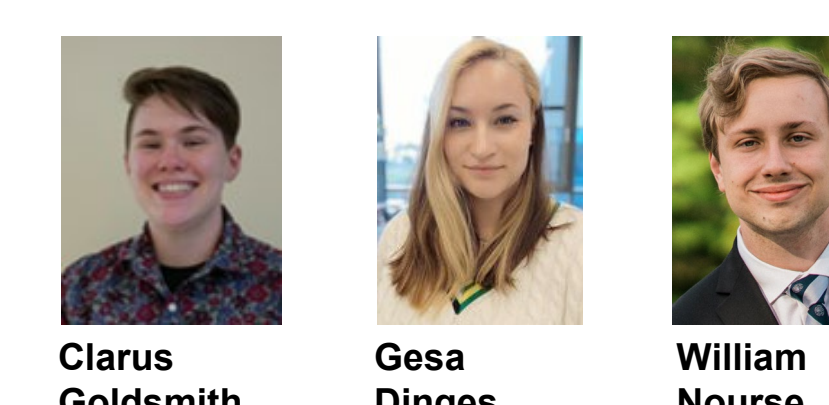


Szczecinski (SZ) and Quinn (QU) Labs

Robotic and neural modeling for integrating findings and proposing hypotheses



- Framework for rapidly assembling and simulating synthetic nervous system models
- Physically modeling strain detection of CS using nanoCT scans from BL



Ache Lab (AC)

The role of descending neurons (DNs) in controlling adaptive walking

