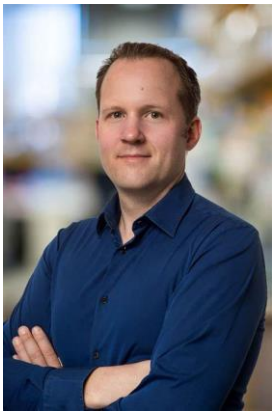
# ITEASc Seminar/MBG FOCUS TALK

Hosted by Stig Uggerhøj Andersen

**Thursday 2 May 2024 at 16:00**
NUCLEUS (1871-120)

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## Engineering Root Traits for Climate Change Mitigation


Climate change will soon profoundly and negatively affect the vast majority of our planet's biota, including most human beings. Despite the importance and urgency of addressing this problem, we still lack technologies to globally address the root cause of climate change – increased levels of $CO_2$ in the atmosphere. Since plants are central agents in the earth's carbon cycle, fixing atmospheric carbon that then mostly gets released when they decompose, engineering plant traits that affect the decomposition rate of plant derived carbon molecules can potentially lead to a large and globally significant drawdown of atmospheric $CO_2$. In particular, root systems and the rhizosphere are of interest for such approaches as soils are enormous carbon sinks. Since plants first colonized the earth's land surfaces, their carbon depositions have built up three times more carbon in the soil than is contained in the atmosphere. Specific root traits are important contributors to the accumulation and permanence of carbon in the soil. These include root depth, root biomass and the levels of refractory carbon compounds in root tissues. I will present our efforts in using natural variation, genome wide association mapping, chemical genetics and functional genomics approaches in the model plant *Arabidopsis thaliana* and several crop species to identify genetic and molecular mechanisms that regulate these traits and attempt to utilize this knowledge to enhance traits relating to carbon accumulation and permanence in soils.


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