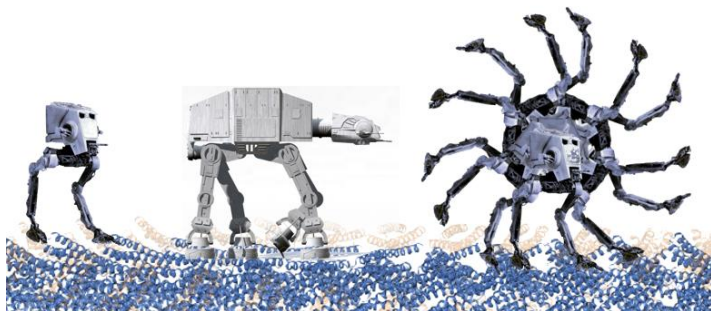


A **postdoctoral** position on the topic on *de novo* protein design is available in the Ljubetič group at the National Institute of Chemistry in Ljubljana, Slovenia

Design and study the movement of a *de novo* protein walker



Proteins are nature's nano-robots, catalysing reactions, recognising molecules, and transporting cargo. Biomimetic nanomachines have the potential to solve current real-world problems, however use is limited by existing folds and inadequate stability of natural proteins. *De novo* designed proteins are hyper-stable and can achieve properties and shapes not explored by evolution.

CC-WALK aims to build a foundation for the next grand challenge in protein design: creating dynamic protein assemblies that have several states and/or perform functions such as motion. Combining protein engineering,

computational modelling and wet-lab experiments, CC-WALK will design proteins capable of walking along a designed protein track. We will construct tracks from designed protein fibres along which walkers will be propelled by Brownian motion. Anchors capable of functionalizing the fibres will be attached to the ends. Novel large oligomers will be designed to serve as anchors using cutting edge AI protein design methods. Single molecule TIRF combined with optical tweezer will be used to experimentally study the system.

Now is the perfect time to be a protein designer! Postdoc will apply the latest protein design methods, that are very transferable to other fields. RFDiffusion and AFDesign will create rigid scaffold connections. ProteinMPNN will be used to design side chains. Rosetta and AlphaFold2 will be used for filtering. One of the key innovations is the application of cutting-edge AI protein design methods to design multistate assemblies and molecular robots. Molecular robots have the potential to solve many pressing problems from drug delivery in precision medicine to self-healing and self-cleaning materials. Some of our recent publications include: [Ljubetič, Nature Biotechnology, 2017](#); [Ljubetič, Curr. Opinion Struct Biol, 2017](#); [Drobnak, JACS, 2017](#); [Aupič, Nature Communications, 2021](#); [Linder, Nature Machine Intelligence, 2022](#);

You must have:

- PhD degree in biochemistry, biotechnology or related sciences
- A high level of self-motivation, enthusiasm, and curiosity
- Interest in combining computational and wet-lab approaches
- Excellent verbal and written communication skills in English

Nice to have experience:

- programming languages and tools (python, bash, git)
- structural biology software (Pymol, Chimera etc...)
- fluorescence microscopy or Cryo-EM.
- optical tweezers or atomic force microscope measurements.
- protein production and purification in bacteria or mammalian cells.

What we offer:

- A collaborative environment within a diverse and enthusiastic research group
- State-of-the-art computing and experimental infrastructure (computer cluster with GPUs, Cryo-EM)
- Employment for at least **2 years** with included benefits (healthcare, retirement, paid annual leave)
- Life in Ljubljana, one of EUs safest and greenest capitals, with public healthcare and schools

How to apply:

Send a motivation letter, CV and at least one recommendation letter to ajasja.ljubetic@ki.si. Add "CC-WALK postdoc" in the subject. The ideal starting date would be October 2023, but there is some flexibility. For more information do not hesitate to contact me at ajasja.ljubetic@ki.si.