

# **Biohybrid active matter – how motile cells move passive micro-cargo**

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Cell-driven micro-transport – the movement of micron-sized cargo particles by motile cells – is one of the most prominent applications in the emerging field of biohybrid systems. Here, we demonstrate that motile amoeboid cells can act as efficient and versatile transport agents. Their transport properties result from the mechanical interactions with the passive cargo particle and reveal an optimal cargo size that enhances the locomotion of the load-carrying cells, even exceeding their motility in the absence of cargo. The experimental findings are discussed in terms of an active particle model that explains the observed cell-cargo dynamics and enables us to derive the long-time diffusive spreading of amoeboid microcarriers. Moreover, we estimated transport forces under different environmental conditions, and extended our studies to more complex situations, where cargo particles are collectively actuated by many cells at the same time, aiming at an overall understanding of this novel type of composite active matter.

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**MPI-DS, Maria Goeppert Seminar room (0.79)  
and  
Zoom ID 691 0007 9220, Passcode 856480**

