

University of Groningen

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DOI:
[10.33612/diss.245324359](https://doi.org/10.33612/diss.245324359)

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Document Version
Publisher's PDF, also known as Version of record

Publication date:
2022

[Link to publication in University of Groningen/UMCG research database](#)

Citation for published version (APA):
Babu, D. (2022). *Motility of active droplets in lipid systems*. [Thesis fully internal (DIV), University of Groningen]. University of Groningen. <https://doi.org/10.33612/diss.245324359>

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Stellingen

accompanying the Ph.D. thesis

Motility of active droplets in lipid systems

by

Dhanya Babu

1. Purposeful motility is one piece in the grand puzzle of building synthetic living systems.
2. Over thousands of years, microorganisms have evolved complex bio machinery to navigate the harsh world where viscosity dominates. The first step in building minimalistic models that mimic such complex motility is to harness molecular chemical processes by coupling them with microscopic physical phenomena.

This thesis.

3. Autonomous droplet motility through interfacial flows might seem like a straightforward phenomenon; however, it is a result of physicochemical processes working cooperatively at the nano and microscale that is yet to be understood completely.

*Babu, D., Katsonis, N., Lancia, F., Plamont, R. & Ryabchun, A. Motile behavior of droplets in lipid systems. Nat Rev Chem **6**, 377–388 (2022).*

4. Integrating knowledge and research methods from several disciplines through interdisciplinary research is essential to perform breakthrough science.

*Saw, T., Doostmohammadi, A., Nier, V. et al. Topological defects in epithelia govern cell death and extrusion. Nature **544**, 212–216 (2017).*

*Isomursu, A., Park, KY., Hou, J. et al. Directed cell migration towards softer environments. Nat. Mater. **21**, 1081–1090 (2022).*

5. Perseverance is paramount to all the scientific skills imperative for an experimental researcher.
6. Diversity begets diversity: Diversity in thought and ideas starts with diversity on the academic work floor.

Hofstra, B., Kulkarni, V. V., Munoz-Najar Galvez, S., He, B., Jurafsky, D., & McFarland, D. A. The diversity–innovation paradox in science. Proceedings of the National Academy of Sciences, 117, 9284-9291 (2020).

7. I stand on the shoulders of those before me - the overlooked, the sidelined, the disfavoured. The women in science, who nevertheless persisted and paved the way for many to come. Every stone we lay today paves the way for many more.
8. After 9 years in the Netherlands, Dutch culture influences my research and personal life in the same way – discipline and meticulous planning.