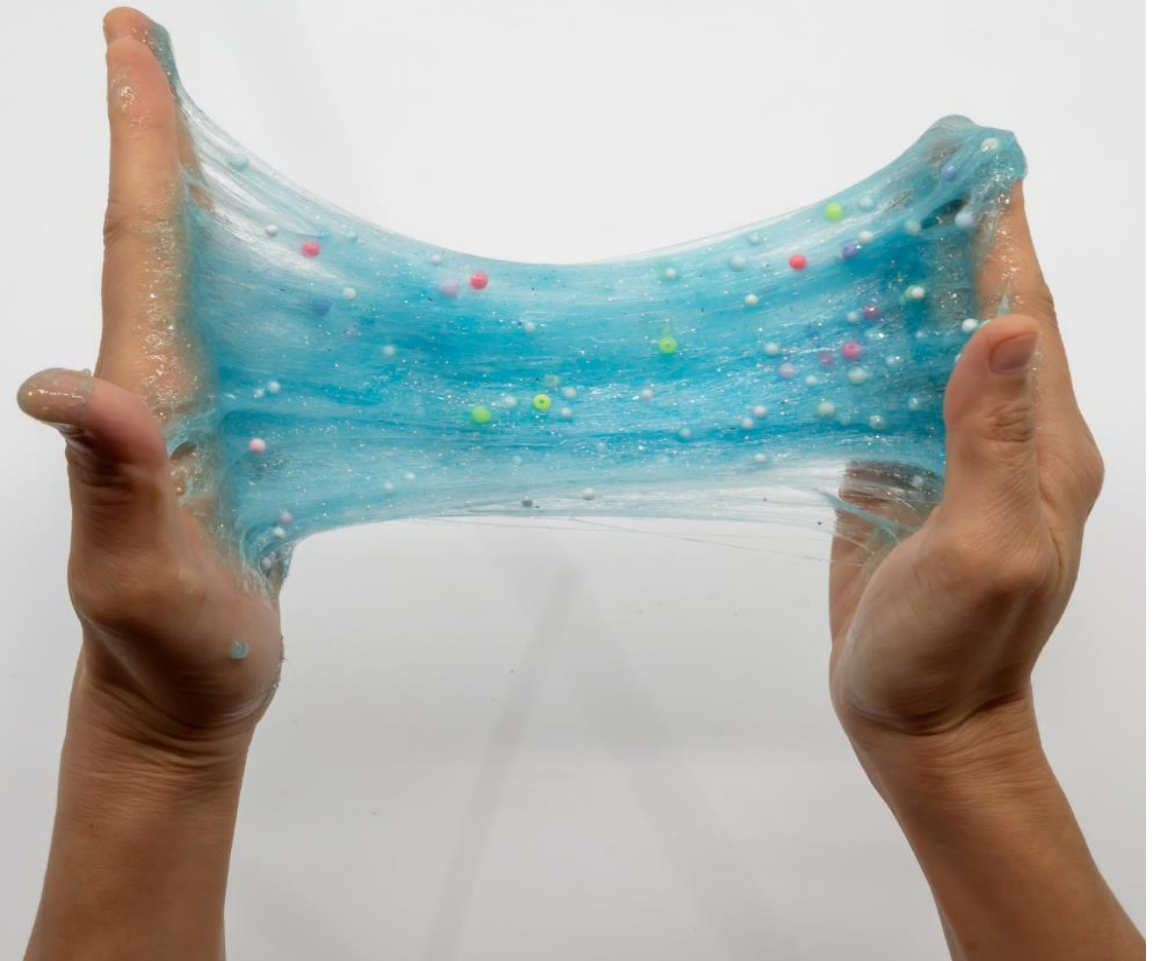


Designer Adhesives

Prof. Dr. Inge K. Herrmann

Mechanical & Process Engineering
Nanoparticle Systems Engineering Laboratory



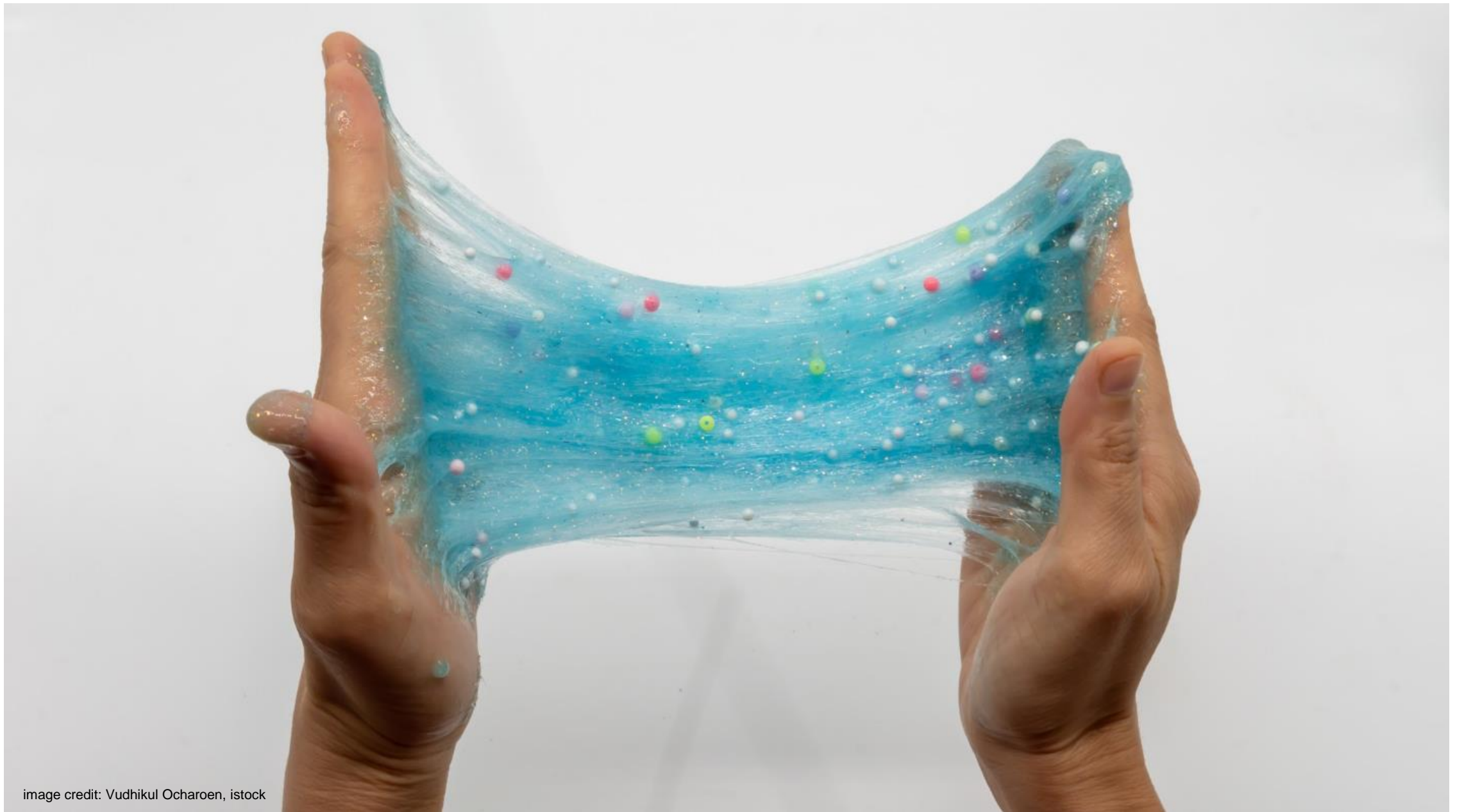
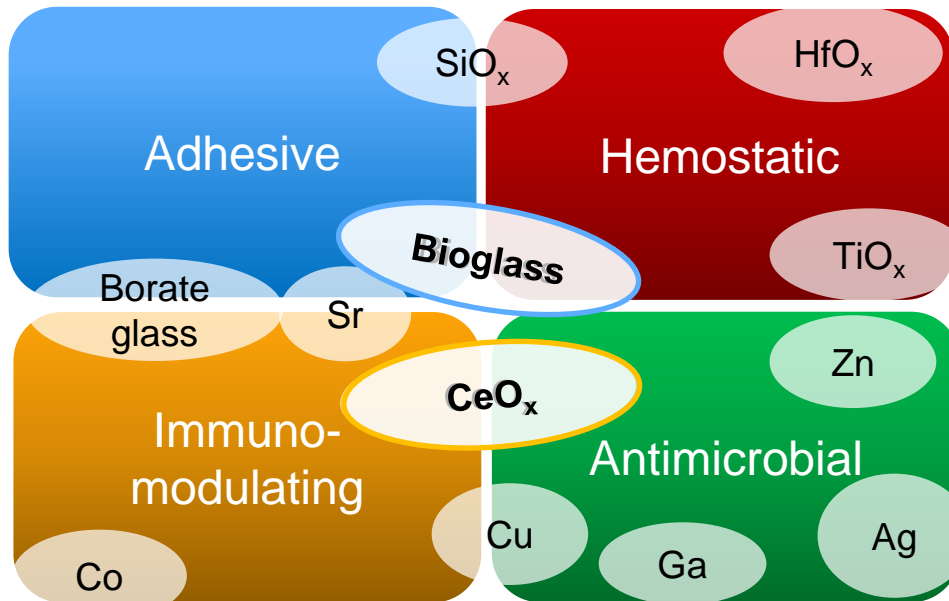


image credit: Vudhikul Ocharoen, istock

Designer nanoparticle glues

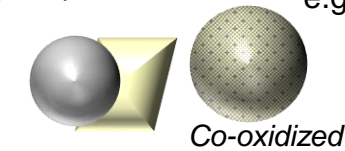
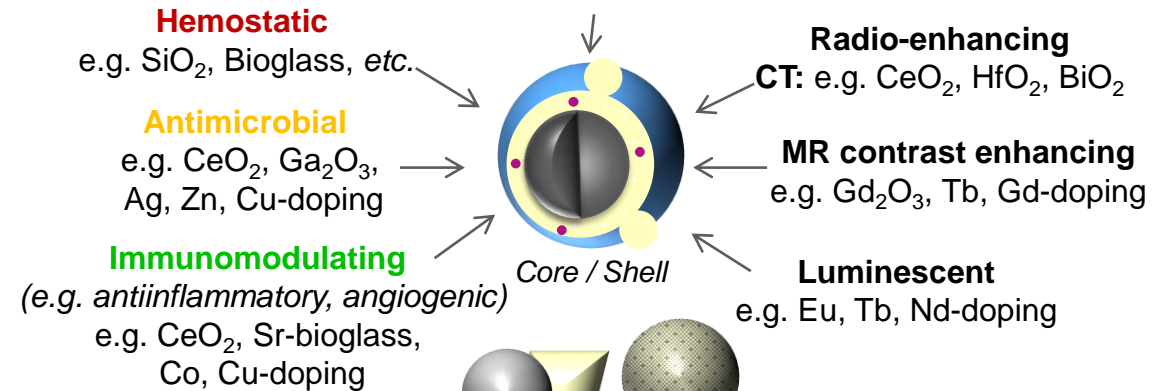
Tailoring Structure – Function Composition – Architecture – Particle Size



hermetic porous discontinuous

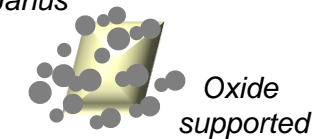
Adhesive

e.g. SiO_2 , Bioglass, etc.



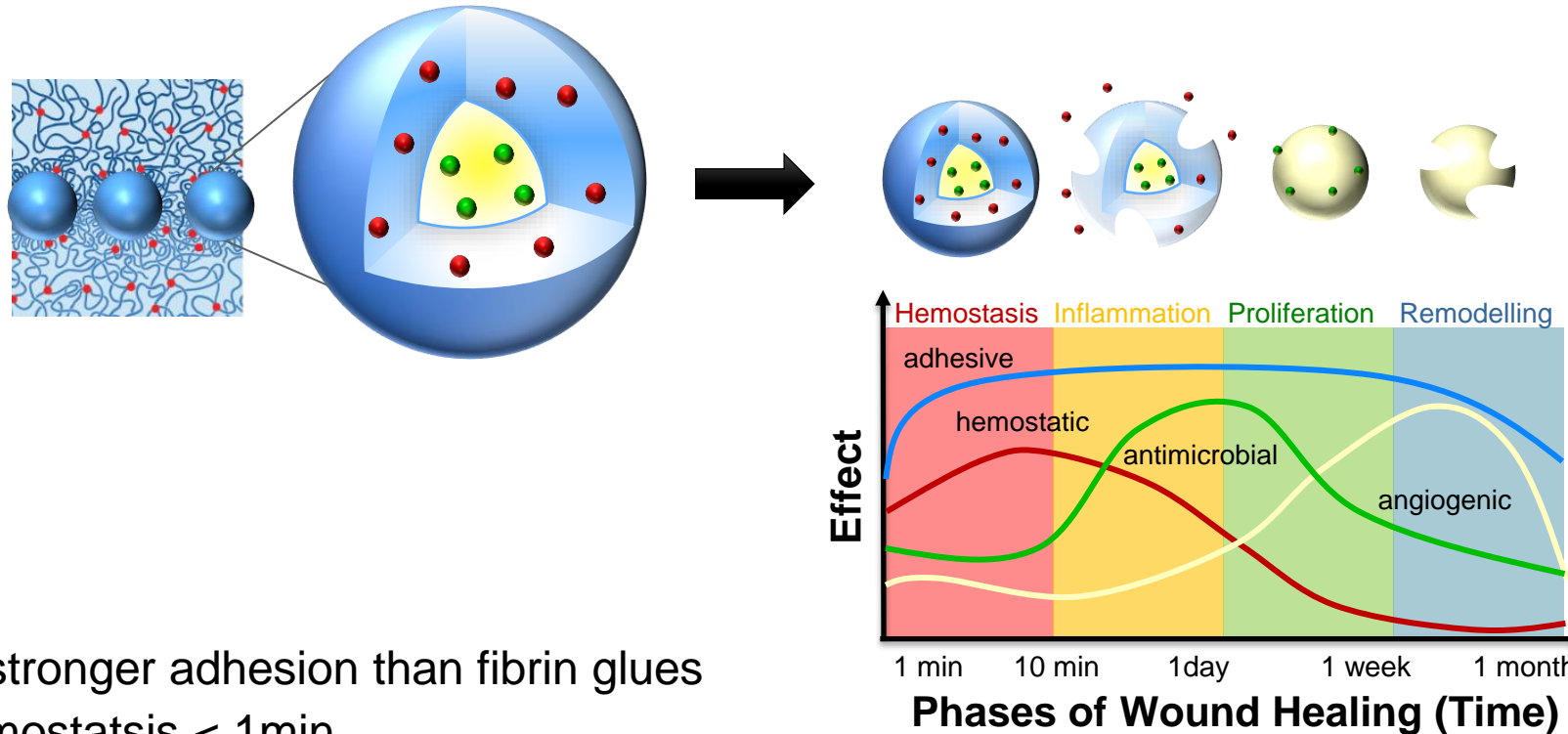
Janus

Co-oxidized



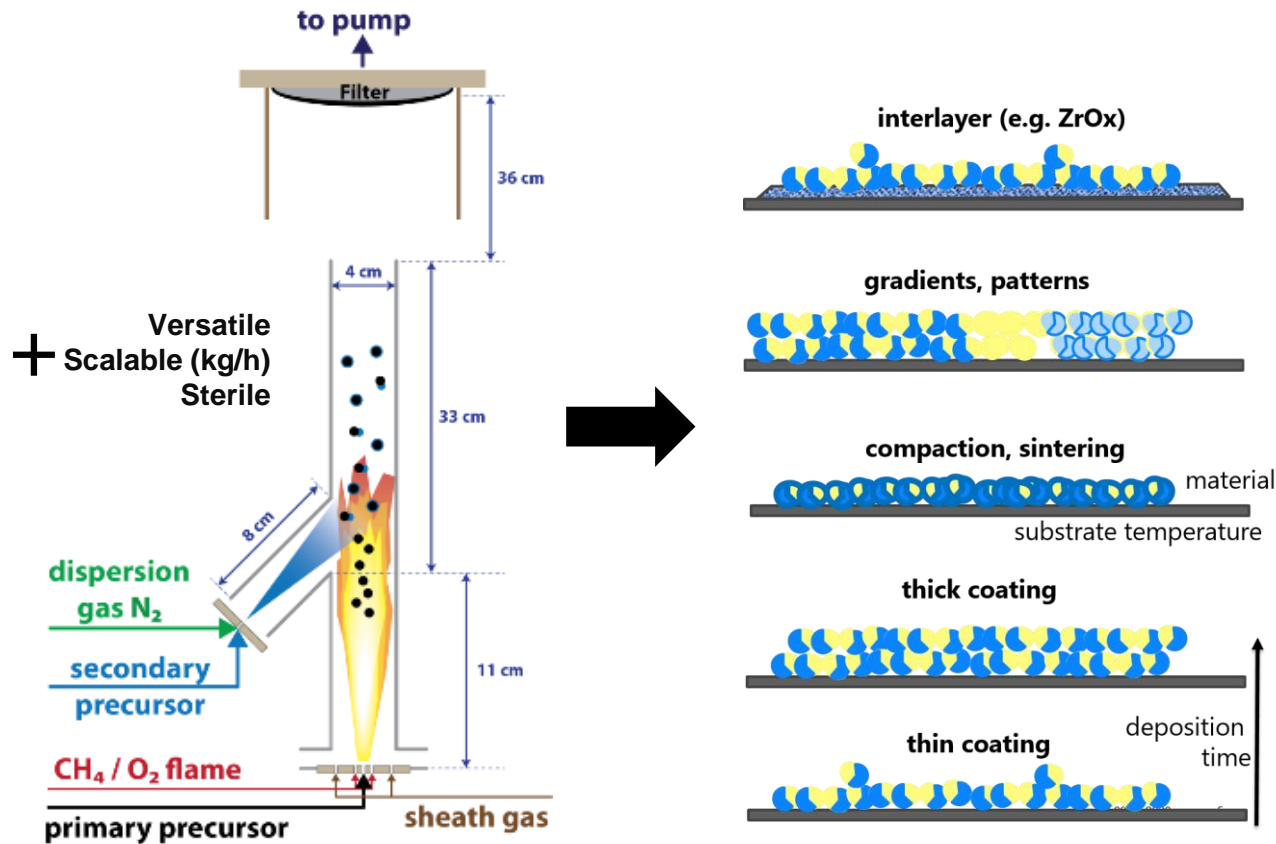
Oxide supported

Tissue glues with tailored (bio)activity



- 2x stronger adhesion than fibrin glues
- Hemostatsis < 1min
- Eradicates > 99% of microbes
- Protects mammalian cells from oxidative stress
- Promotes neovascularization
- Reduces inflammation

From glues to bioactive coatings



EP19216118

- Bioactive soft tissue glues (wound healing, skin transplants)
- Antimicrobial surfaces & coatings (e.g. implants)
- Antastomotic sealants
- Antimicrobial additives (silver-free!)
- ...

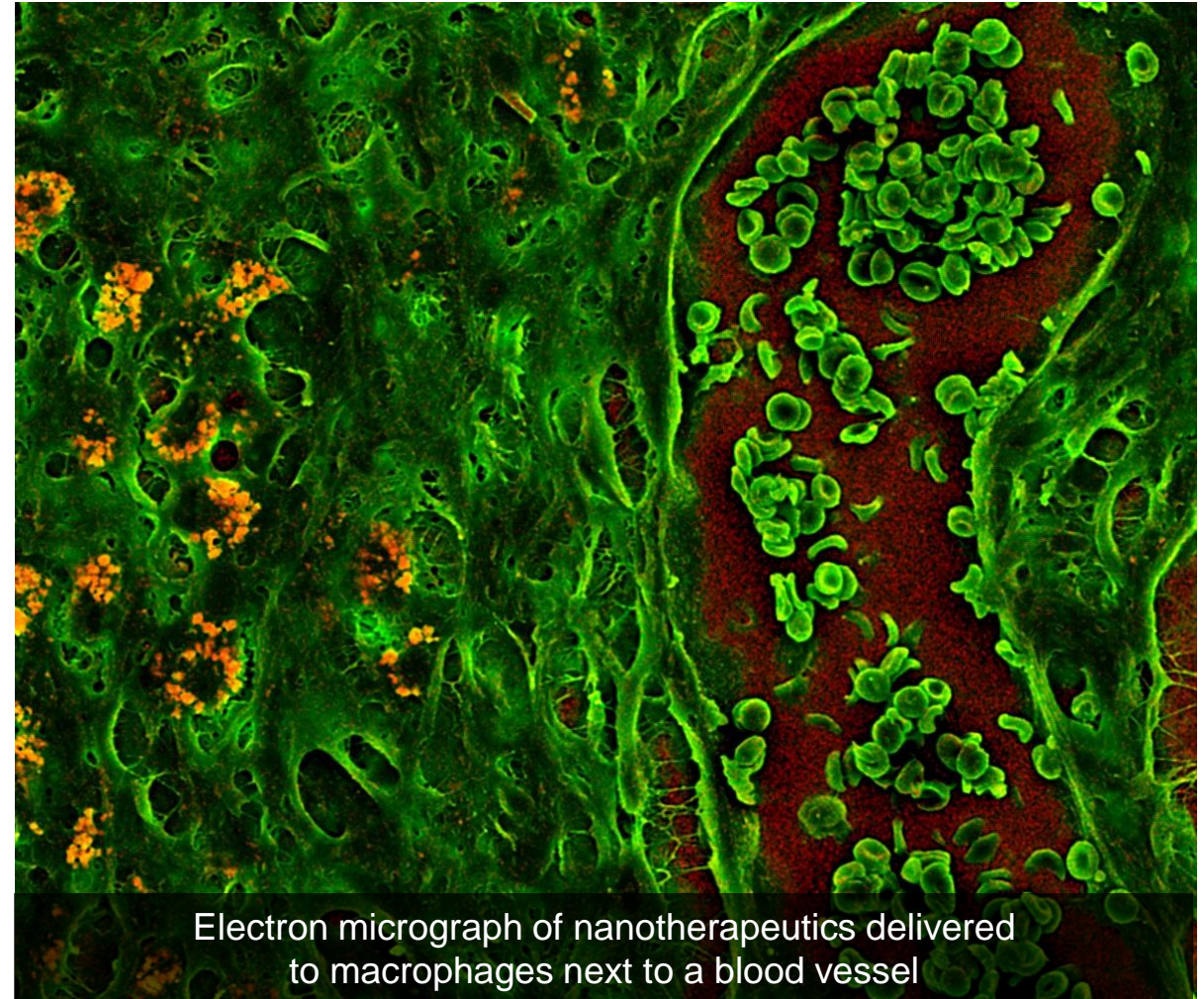
Thank you for your attention!

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Electron micrograph of nanotherapeutics delivered to macrophages next to a blood vessel