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**Electrodeless electro-hydrodynamic printing of nano-suspensions for personalized medicines**[1] EZINWA ELELE, YUEYANG SHEN, RAJYALAKSHMI BOPPANA, AFOLAWEMI AFOLABI, ECEVIT A. BILGILI, BORIS KHUSID, New Jersey Institute of Technology — Drop-on-demand (DOD) dosing is a promising strategy for manufacturing of personalized medicines. However, current DOD methods developed for chemically and thermally stable, low-viscosity inks are of limited use for pharmaceuticals due to fundamentally different functional requirements. To overcome their deficiency, we developed an electro-hydrodynamic (EHD) DOD method (Appl Phys Lett 97, 233501, 2010) that operates on fluids of up to 30 Pas over a wide range of droplet sizes, does not require direct contact of a fluid with electrodes and provides a precise control over the droplet volume. As most drugs are poorly water soluble, the use of nanoparticles dispersed in water is a promising method for enhancing the drug dissolution rate and bioavailability. The work demonstrates the EHD DOD ability to print aqueous suspensions of drug nanoparticles on highly-porous polymer films. We present a scaling analysis that captures the essential physics of drop evolution. These results show that EHD DOD offers a powerful tool for the evolving field of pharmaceutical technologies for tailoring medicines to individual patient's needs by printing a vast array of predefined amounts of therapeutics arranged in a specific pattern on a porous film.

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Boris Khusid
New Jersey Institute of Technology

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