Linear dielectric response of clustered living cells

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(Dated: June 7, 2018)

Abstract

The dielectric behavior of a linear cluster of two or more living cells connected by tight junctions is analyzed using a spectral method. The polarizability of this system is obtained as an expansion over the eigenmodes of the linear response operator, showing a clear separation of geometry from electric parameters. The eigenmode with the second largest eigenvalue dominates the expansion as the junction between particles tightens, but only when the applied field is aligned with the cluster axis. This effect explains a distinct low-frequency relaxation observed in the impedance spectrum of a suspension of linear clusters.

PACS numbers: 41.20.Cv, 87.19.rf, 87.50.C-

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