Curiosity-driven discoveries can often inspire new hypotheses in scientific research and solutions for problems. I will start with a few curiosity-driven discoveries about graphene oxide (GO) sheets, the chemical exfoliation products of graphite powders, leading to new materials-agnostic hypotheses about 2D systems and new applications. These include GO’s amphiphilicity and function as 2D surfactant, fluorescence quenching microscopy for seeing 2D materials, bulk nanofluidic materials, aggregation-resistant paper-ball like ultrafine particles, viscoelastic colloidal doughs and isotropic 2D solids, and the application of GO to solve some difficult chemical problems in hair coloring. Next, I will introduce some recent effort in developing material approaches for chemical and physical modulation of respiratory droplets, aiming to strengthen public health responses to mitigate and control the spread of infectious respiratory diseases.

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