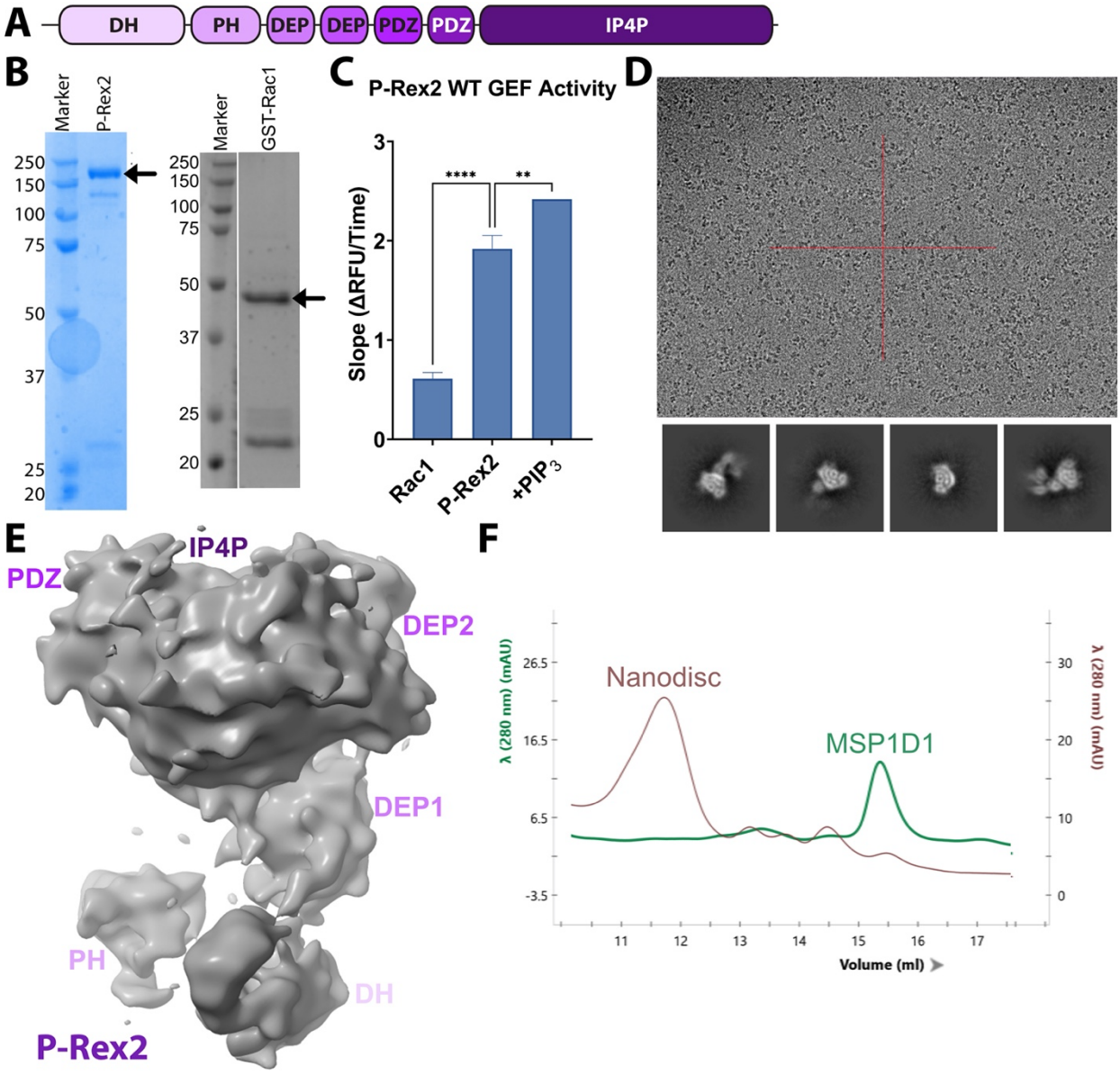


**Figure 1. Preliminary data** A) Domain layout of P-Rex. B) SDS-PAGE showing expression and purification of proteins needed for these projects. On the left is purified P-Rex2 and on the right is partially purified, GST-tagged, lipidated Rac1. Arrows indicate proteins of interest. C) Guanine-nucleotide exchange assay using mant-GTP to observe the activation of Rac1 over time. The first bar shows the intrinsic exchange rate of soluble Rac1, the second shows the increase in this by P-Rex2, and the third show the further increase in the presence of $PIP_3$-containing nanodiscs. Assays were performed once in triplicate. P= **<0.01, ****<0.0001. D) Representative micrograph of the unactivated P-Rex2 sample. The panel below shows the vastly predominant classes from 2D classification, highlighting a preferred orientation of the sample on grids. E) Preliminary, low-resolution cryo-EM map of the unactivated state of P-Rex2 generated from 11,347 particles. F) Size-exclusion chromatography showing a peak shift upon formation of nanodiscs from MSP1D1 protein.