Supporting Information

Van der Waals Epitaxy of Large-area and Single-crystalline Gold Films on MoS$_2$ for Low-Contact-Resistance 2D-3D Interfaces.

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Figure S1. Full range of XRD data. Only (111) and (222) can be identified from the Au film no matter grown at which substrates.
**Figure S2.** Large scale (~10 μm) SEM images of Au@MoS$_2$ and Au@Mica. Please note that Au@MoS$_2$ exhibits better continuity and less grooves than Au@Mica. Some islands in Au@Mica are not conductive since they are not connected to surrounding islands.