

Fig.1. Biochip design: (A) top and bottom layers used in the biochip manufacturing and (B) structures of microwells in culture chamber (bottom layer).

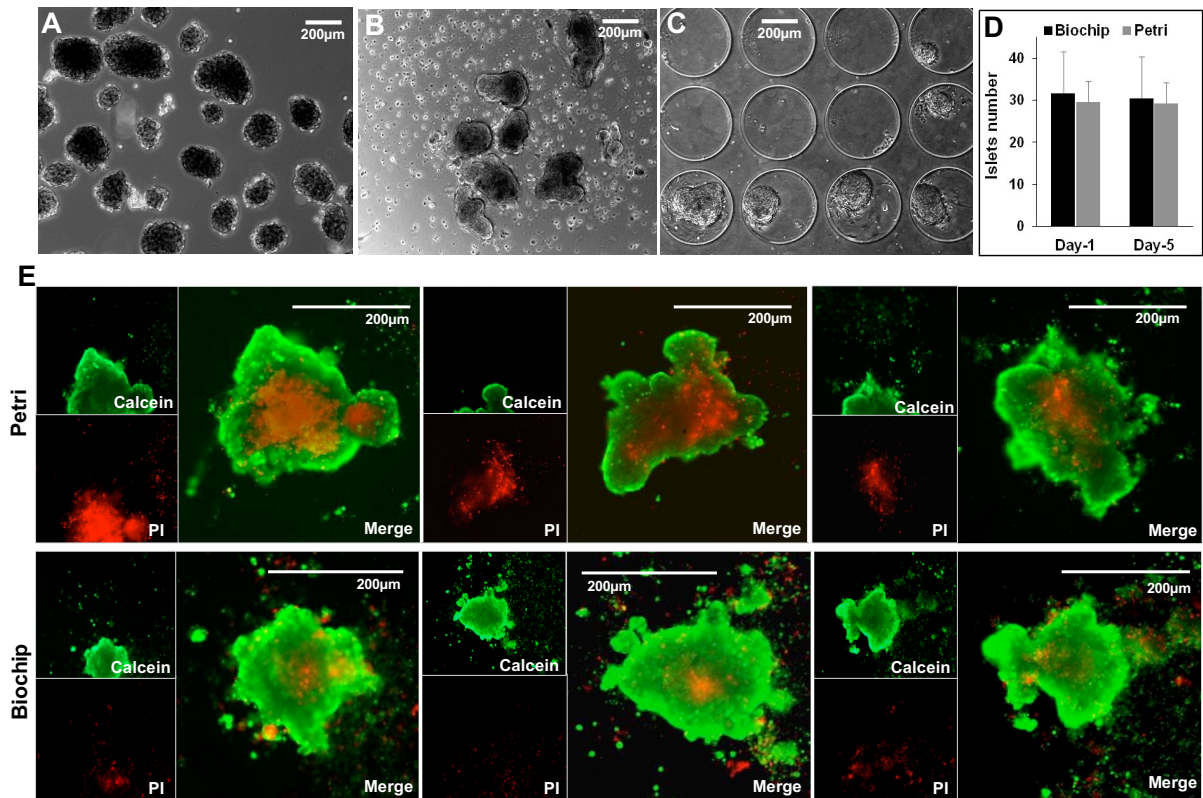


Fig.2. Morphology of islets after extraction (A), after 5 days of culture in Petri (B) and after 5 days of culture in biochip (C); number of islets at days 1 and 5 in biochip and Petri (D); and calcein AM/propidium iodide staining of islets after 5 days of culture in Petri and biochip (E).

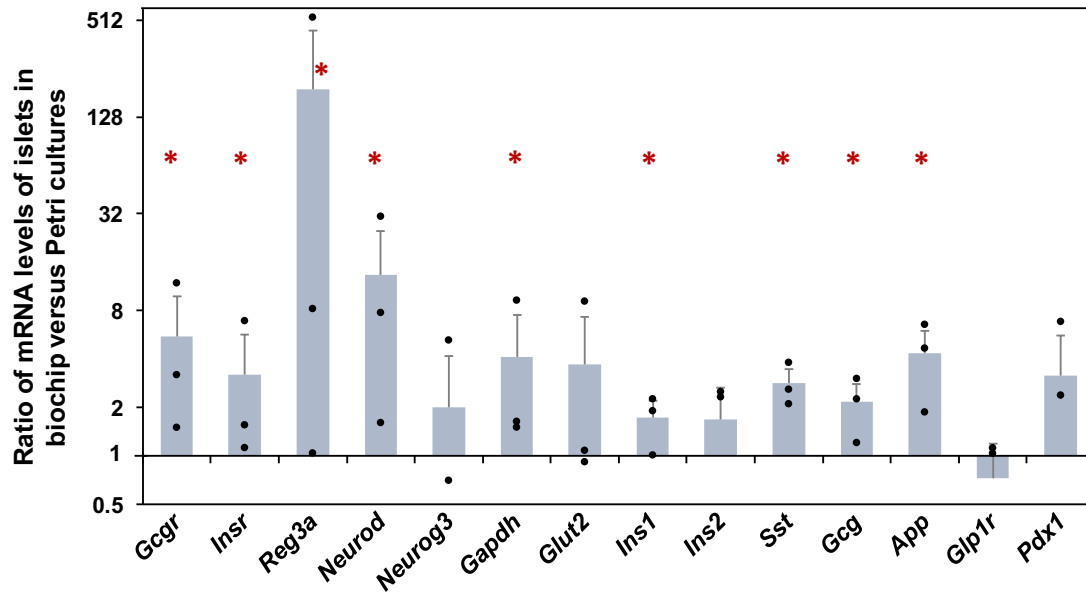


Fig.3. Ratio (biochip/Petri) of mRNA levels of selected important pancreatic genes after 5 days of culture. * $P < 0.05$, mRNA level significantly different between biochip and Petri cultures.

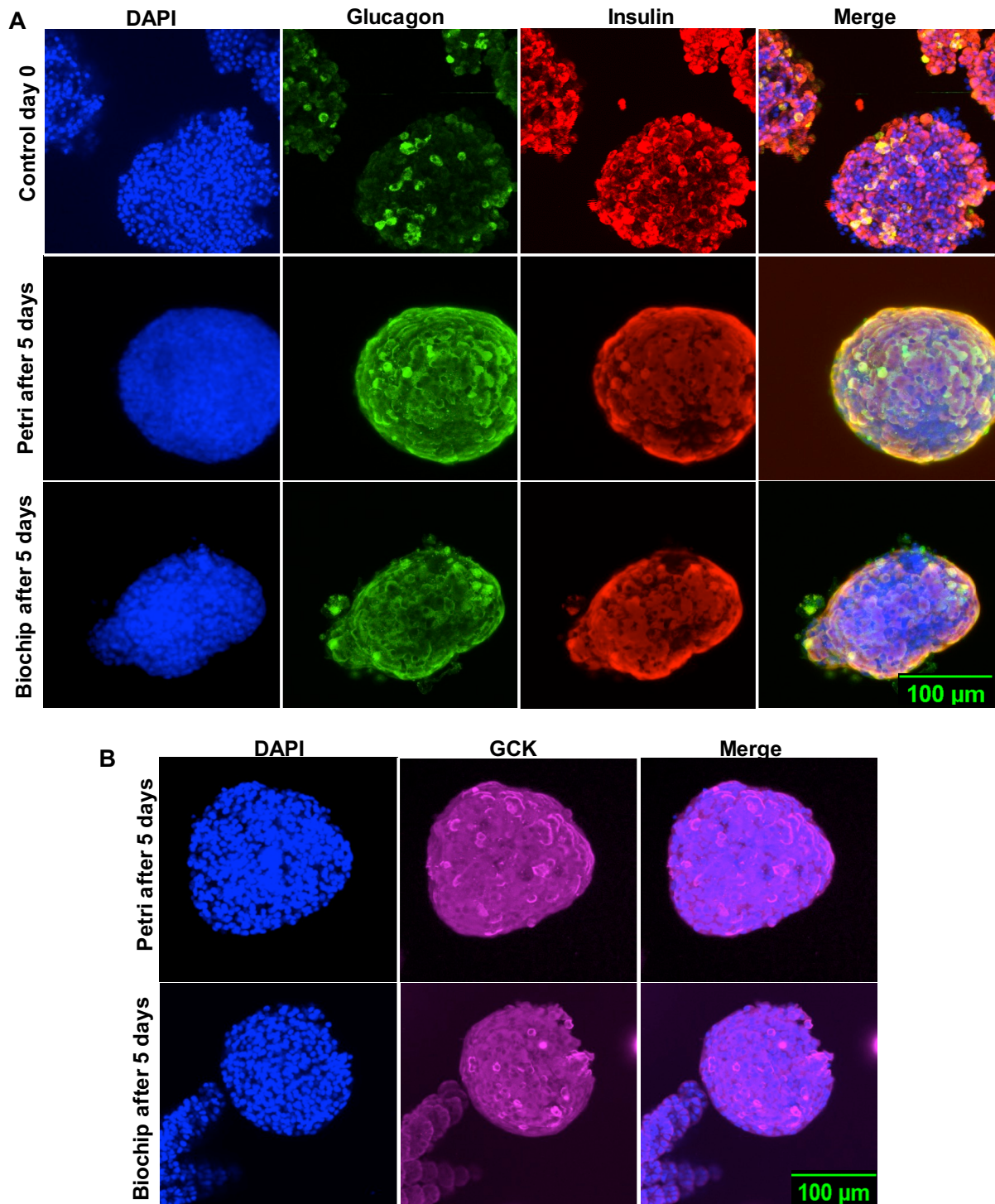


Fig.4. Islets immunostainings: (A) DAPI, insulin, glucagon and merge at day 0 and after 5 days of culture in biochip and petri; (B) DAPI, GCK and merge after 5 days of culture in biochip and Petri.

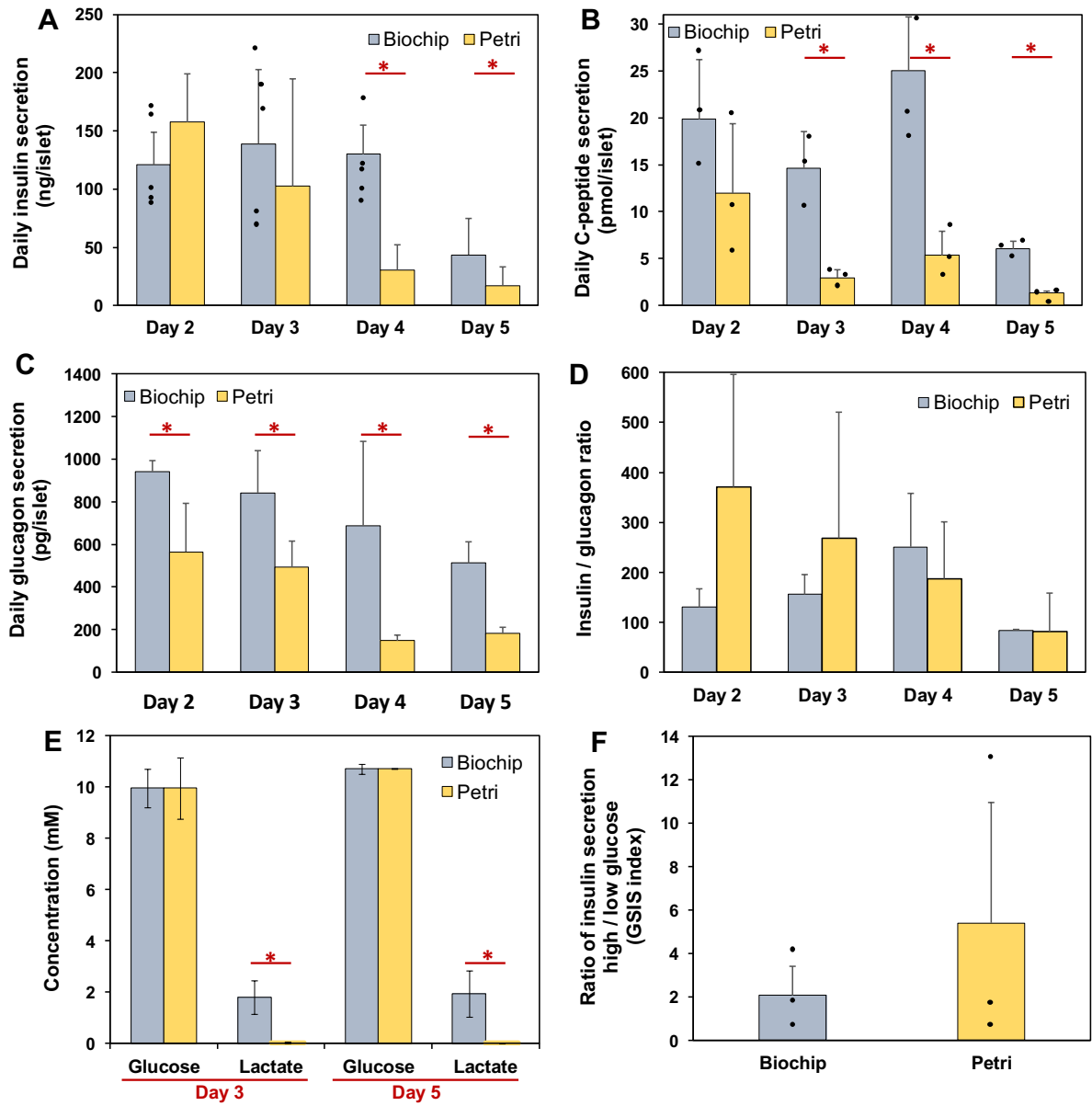


Fig.5. (A) Insulin, (B) C-peptide and (C) glucagon secretion during 5 days of culture in biochip and Petri; (D) insulin/glucagon ratio; (E) glucose and lactate production in Petri and biochip after 3 and 5 days of culture; and (F) ratio of insulin production (high/low, GSIS index) in biochip and Petri after high/low glucose stimulations ($*P < 0.05$).

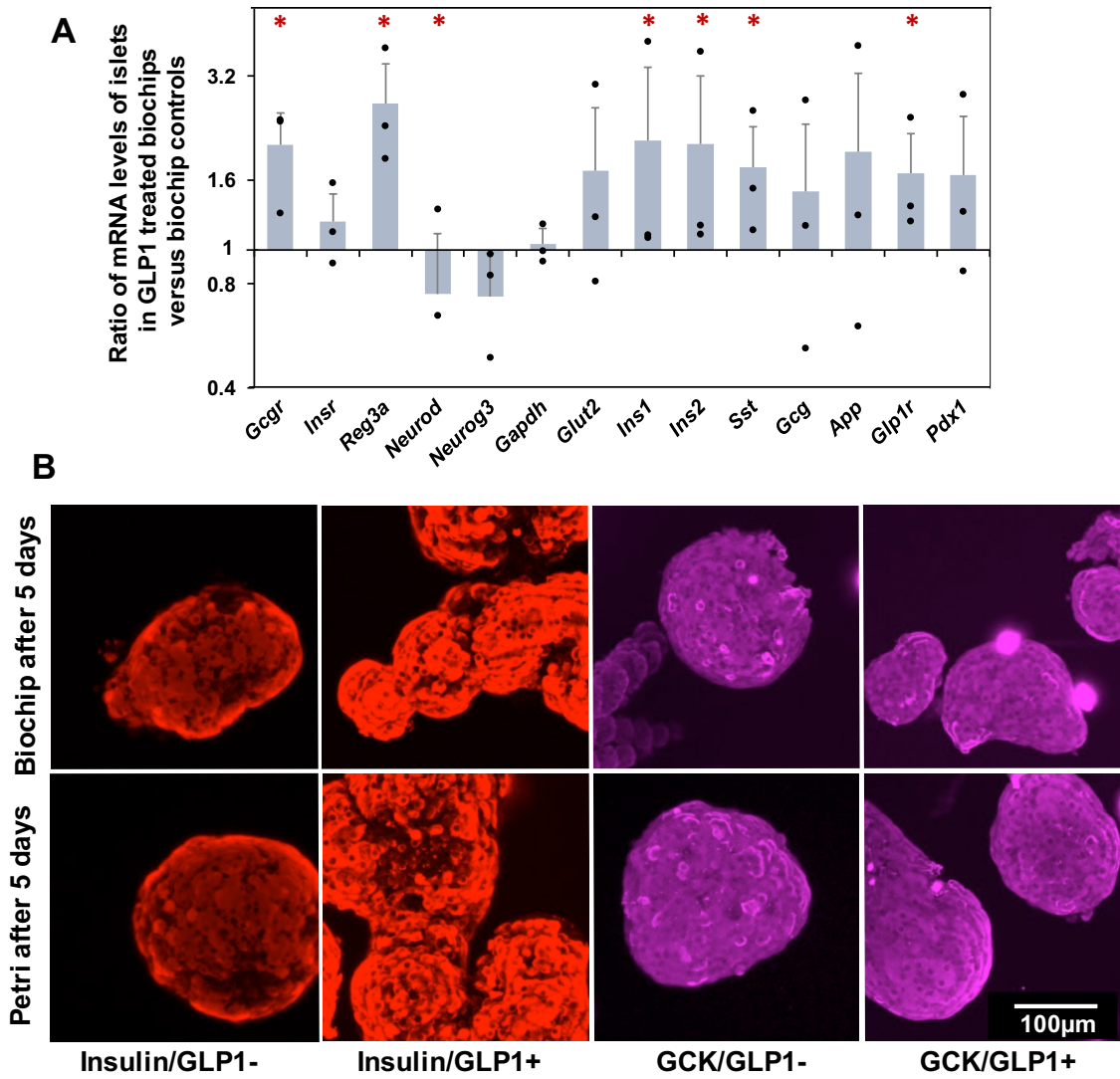


Fig.6. (A) Ratio of mRNA levels (GLP1 treated biochip/control biochip) of selected pancreatic genes after GLP1 stimulation; and (B) insulin and GCK immunostainings in controls and GLP1 treated biochip/Petri. * $P < 0.05$, mRNA level significantly different between GLP1 treated biochip and control biochip.

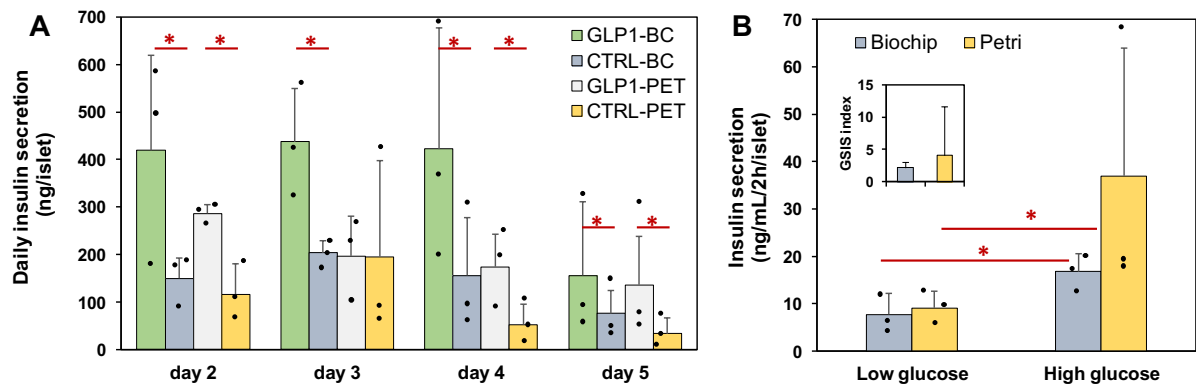


Fig.7. (A) Insulin secretion in controls and GLP1 treated biochip and Petri during 5 days of culture; and (B) insulin secretion and GSIS index in GLP1 treated biochip and Petri during high/low glucose stimulations (* $P < 0.05$).