**Motivation**

- Neonatal jaundice and hyperbilirubinemia are related with severe illnesses such as hemolytic disease, metabolic and endocrine disorders, and infections. Therefore, the measurement of total bilirubin is one of the most frequently performed tests in neonates, and the bilirubin level is managed to prevent bilirubin neurotoxicity by treatment.

**Design and Principle**

Schematic of microchannel for plasma extraction.

Mechanism of plasma extraction by bottom channels.

- Our microfluidic chip extract plasma from whole bloods with commercial productivity, and a measurement system without other operation. Obtained plasma also was utilized for various testing by using indicators of target biomarkers.

**Extraction and Measurement**

Injection molding using a micropatterned mold.

Collection area filled by extracted plasma.

Pafomance of plasma extraction.

- Neonatal jaundice is defined as a total serum bilirubin level above 5 mg/dL, and our device have a sensitivity enough to diagnosis.

- Patent applied for

**Conclusions**

- We presents a novel one-step blood testing device which extracts plasma from a minute amount of whole blood (<5μL) and measures total bilirubin in the plasma for early diagnosis of neonatal jaundice in a bed side.

- Our microfluidic chip extracte plasma from whole bloods with commercial productivity, and a measurement system without other operation. Obtained plasma also was utilized for various testing by using indicators of target biomarkers.