**Congenital Heart Disease in Children**

- Accurate 3D diagnosis is indispensable for successful surgical operation because anatomy and hemodynamics are very complex.
- If we could make tangible replicas of the individual heart and perform rehearsal of the operation, it would be very helpful for surgeons.

**Plastic Replicas with Stereolithography**

A rapid prototype technology whereby an ultraviolet laser beam selectively solidifies photosensitive and polymeric liquid plastic.

1) MSCT  
2) Polymerization  
3) Plastic replicas

**Flexible Replicas with stereolithography and vacuum casting**

Plastic molds representing the outer and inner surface of the hearts were initially made with stereolithography. Then, urethane materials were injected into the space by vacuum casing. After solidification, the casts were carefully removed.

4) Mold production  
5) Pouring urethane under vacuum condition  
6) Flexible replicas

The vacuum casting is a promising technique for medical education, simulation of individual surgery, and planning of innovative surgical procedures of CHDs.