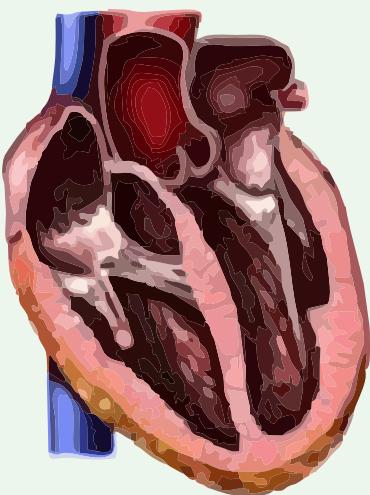
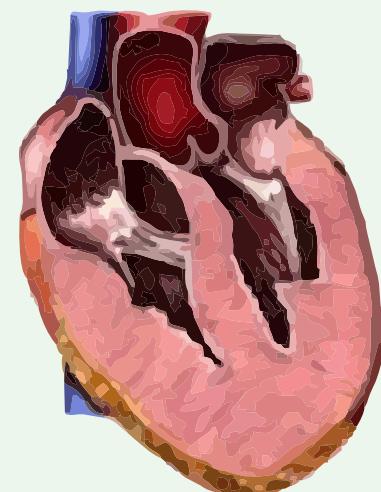
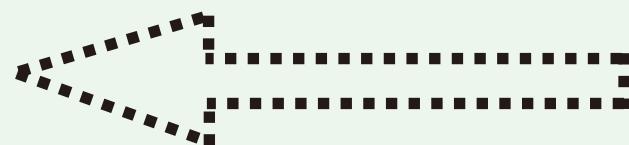


# Factors associated with autophagy promote cardiac hypertrophy

- Abnormal expression of autophagy-related genes
  - Atg5, Atg7, beclin 1, MAP1LC3A
- Chemical stimuli
  - High-fat diet, Ethanol
- Mitochondrial dysfunction
- Cardiomyocyte  $\text{Ca}^{2+}$  overload, disregulated mitophagy
  - miR-29, miR-199a, miR-365, miR-212/132



## Autophagic modulators



## Normal heart

## Cardiac hypertrophy

- microRNAs
  - miR-34a, miR-103, miR-26b-5p, miR-204-5p, miR-497-3p
- Inhibition or activation of specific proteins
  - NLRC5, HDAC, MSTN
- Endogenous molecules
  - midkine, 9-PAHSA

# Factors associated with autophagy inhibit cardiac hypertrophy