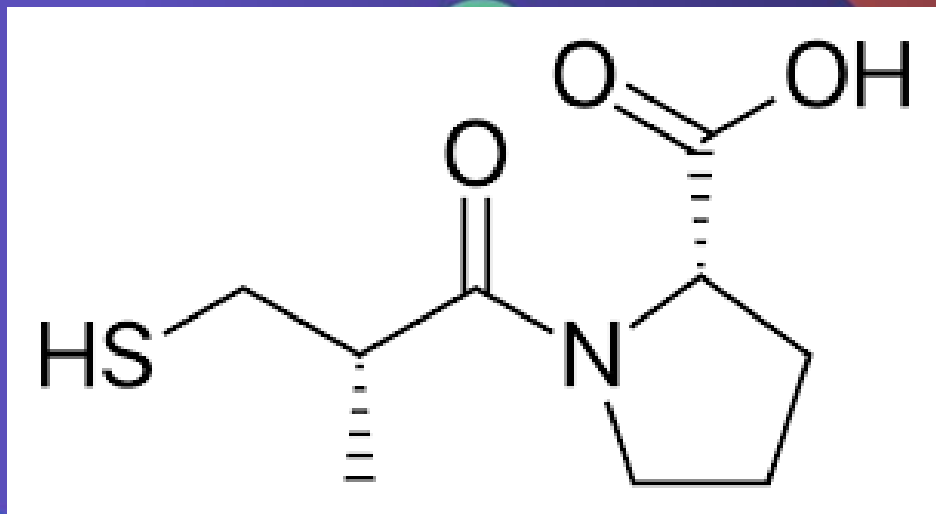
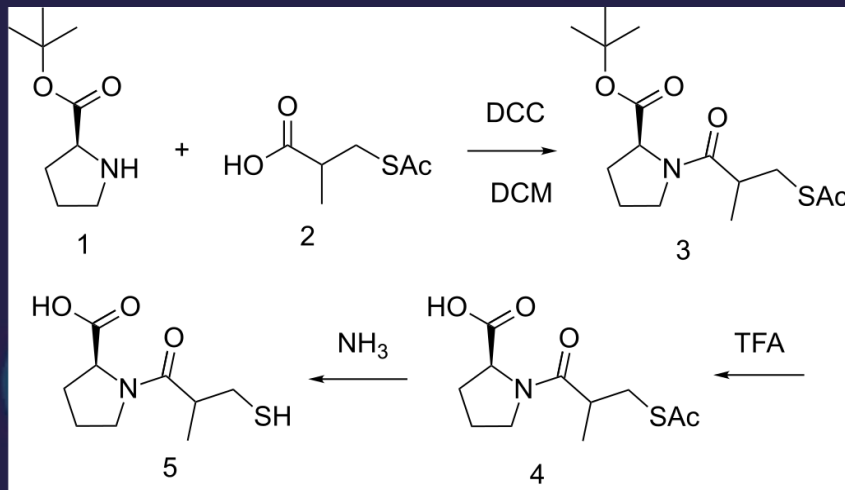


# Captopril



Landon Dawson

# General Information



- IUPAC name: (2S)-1-[(2S)-2-methyl-3-sulfanylpropanoyl]pyrrolidine-2-carboxylic acid
- Brand name: Capoten
- Known as an angiotensin-converting enzyme (ACE) inhibitor
- Administered orally as a tablet
- Was the first established ACE inhibitor
- Typically used to treat patients with high blood pressure or heart failure
- Sometimes used to treat kidney disease cause by type 1 diabetes
- Half life is about 2 hours

## Side Effects

- Lightheadedness/ dizziness
  - Loss of ability to taste
- Flushing, warmth, tingling feeling, redness, rashes
  - Chest pain

## Potential Overdose Effects

- Hypotension
- Decline in kidney function
- Hyperkalemia
- Valvular Stenosis
- Angioedema

Treated with naxolone

Angiotensin-converting enzyme (ACE) inhibitors are medications that help relax the veins and arteries to lower blood pressure. ACE inhibitors prevent an angiotensin I from producing angiotensin II, which is a substance that narrows blood vessels in the renin-angiotensin-aldosterone system (RAAS)

# ACE & ACE Inhibitors

# Development

- Discovered through random screening of 2,000 chemical structures
- Initially studied with 12 patients
- Doses of 400-1000mg a day in treating hypertension
- Showed decrease in blood pressure
- Also displayed a slight increase in plasma potassium content
- Initial doses showed resistance, and doses were adjusted to 50-150 mg daily
- Later trials showed mortality rates in patients with left ventricular dysfunction decrease by approximately 5%



# Pharmacodynamics

- Studies showed 70% absorption after the drug had been administered
- Maximum blood concentration around 0.8-0.9 mg/L
- Bioavailability decreases by 25-50% with food interactions
- Time it took to reach this maximum is around an hour
- 30% of the drug covalently binds to protein within the blood

# Pharmacokinetics

Parameter	Captopril
$T_{max}$ (hr)	.98
$C_{max}$ (ng/ml)	1210
Bioavailability (%)	72
Protein Binding (%)	97
$T_{1/2}$ (hr)	.56
AUC (ng/ml/hr)	1673
$IC_{50}$ (nM)	1.1
Dosage (mg)	10

# Enzymatic Interaction & ACE-I binding

<https://proteopedia.org/wiki/index.php/Captopril#:~:text=Captopril%20binds%20to%20the%20ACE,520%2C%20along%20with%20zinc%20cation.>



Questions?