

Lec (2) Summary by Lynn Alhamaideh

* S.E = side effects

Sources of hormones

Natural ← More side effects.

Less side effects → Synthetic

① Most hormones and their Antagonists.

Human

Animal

① GH → taken after

① Insuline

death but Not used Now
↑ S.E ←

② T₃ + T₄

② hCG

↓

Similar to

From Slaughtered

LH Action.

animal's thyroid
glands.

Secreted by

Placenta in

early pregnancy

and excreted

In urine we

take it from here

③ FSH + LH

used for

infertility

taken from

postmenopausal

Ladies's urine.

Disorders affecting endocrine glands

Deficiency states ← More Common Less Common → Excess Production

How to treat it?!
 ① HRT

- Hormonal replacement therapy
- major clinical use of hormones

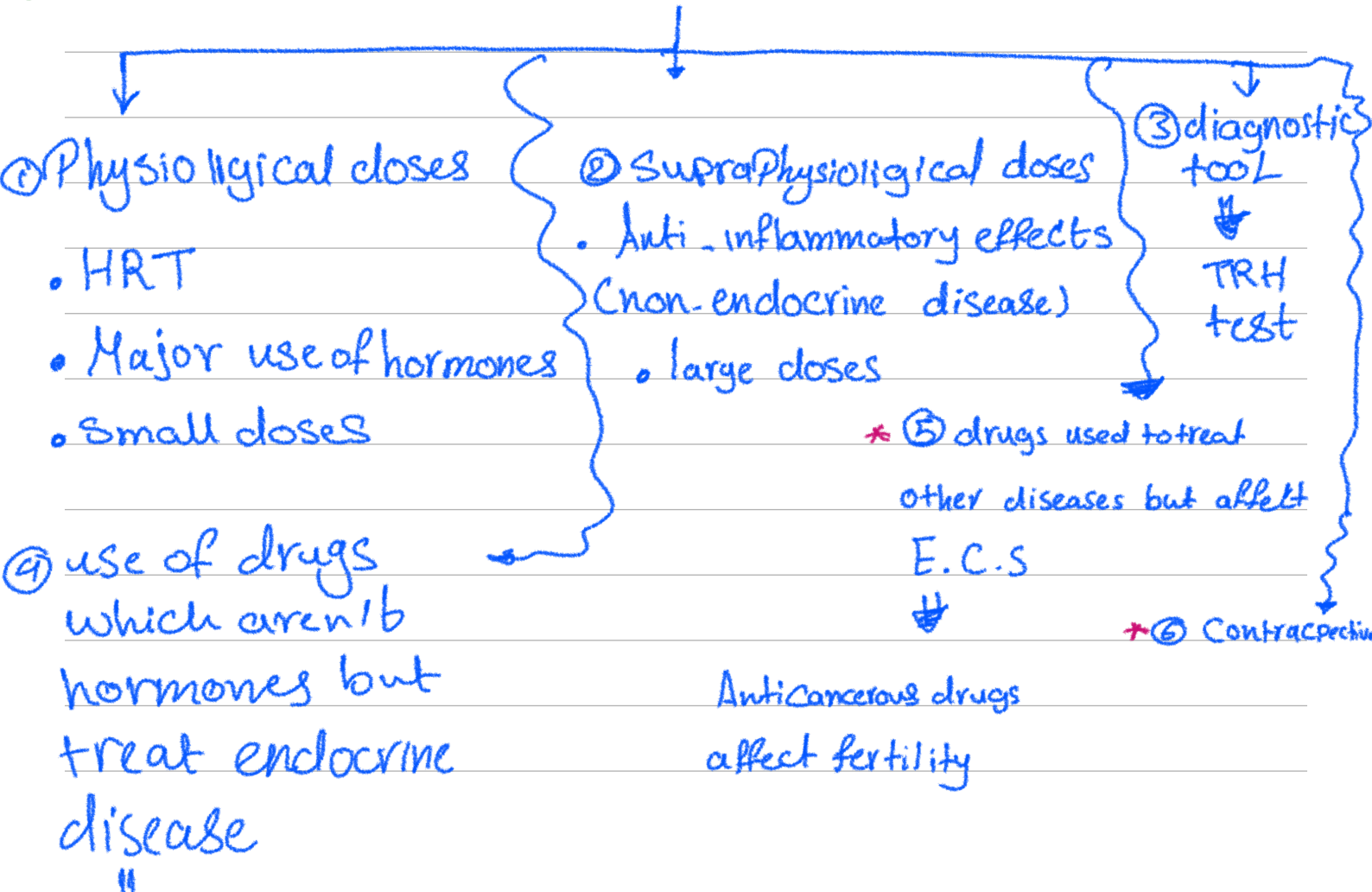
- ② drugs that increase synthesis
- ③ drugs " " release
- ④ drugs " " receptor's sensitivity

How to treat it?!

- ① drugs that inhibit synth.
- ② drugs that inhibit release
- ③ specific antagonist
- ④ Surgery
 ↓ leads to deficiency at the end.

endocrine system
 E.C.S

Clinical use of hormones



ex.

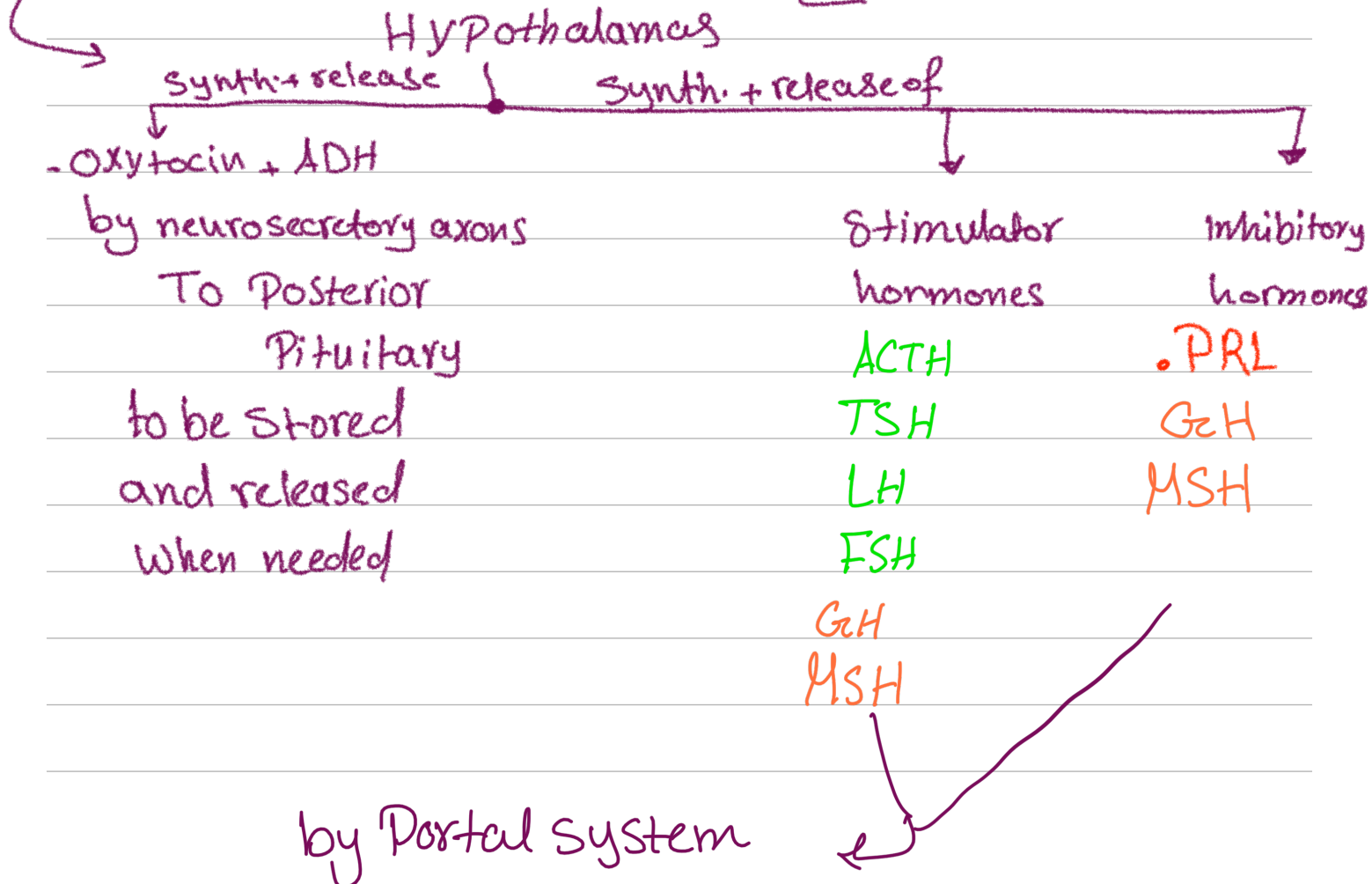
- Anti thyroid drugs
- oral hypoglycemia
- Diabetes (2)

Notes on Point (5 + 6)

- ⑤ How does Anticancerous drugs affect fertility?
by inhibiting DNA Synthesis
- ⑥ Contraceptive isn't a Pathological condition.

Hypothalamic Hormones

Recap from Anat. lectures 



General characteristics of hypothalamic hormones

- Small Peptides and Polypeptides except dopamine
Amino acid derivative ←
- Needed in low concentration
- low M.W
- short $t_{1/2}$
- Act on plasma membrane receptors.

مُؤَيَّة تَفَالِيح عَضَم
↓

① TRH (Protirelin)

- Tri-peptide
- Synthetic analogs ←

② CRH

- 41 amino peptide
- * → A) ↑ Synth. and release of ACTH

* MOA: ↑ PLC → ↑ IP₃ ...

- oral or IV

- * → A) Stimulates TSH from A.P. Gz
- B) ↑ Prolactin through Ca⁺⁺ as 2nd mess.

Use → A) CRH test

* Stress ↑ CRH

↓
↑ ACTH

Uses / → A) TRH test
B) treat hypothyroidism.

→ ③ GzHRH (Hexarelin, Sermorelin)

- 210 Amino Peptide
- Synthetic Preparation

Use \rightarrow A) diagnostic Use
 B) dwarfism treatment S.C

\rightarrow (4) GzHIH (Somatostatin)

- 14 Amino Peptide

* \rightarrow A) \downarrow GzH, Insuline, TSH
 gastrin, glucagon, Seratonine
 ACTH

B) affect glucose levels depending on dose
 low doses \rightarrow \downarrow glucagon \rightarrow hypoglycemia
 high doses \rightarrow \downarrow Insuline \rightarrow hyperglycemia.

Octreotide + lanreotide
 [S.C] [I.M]

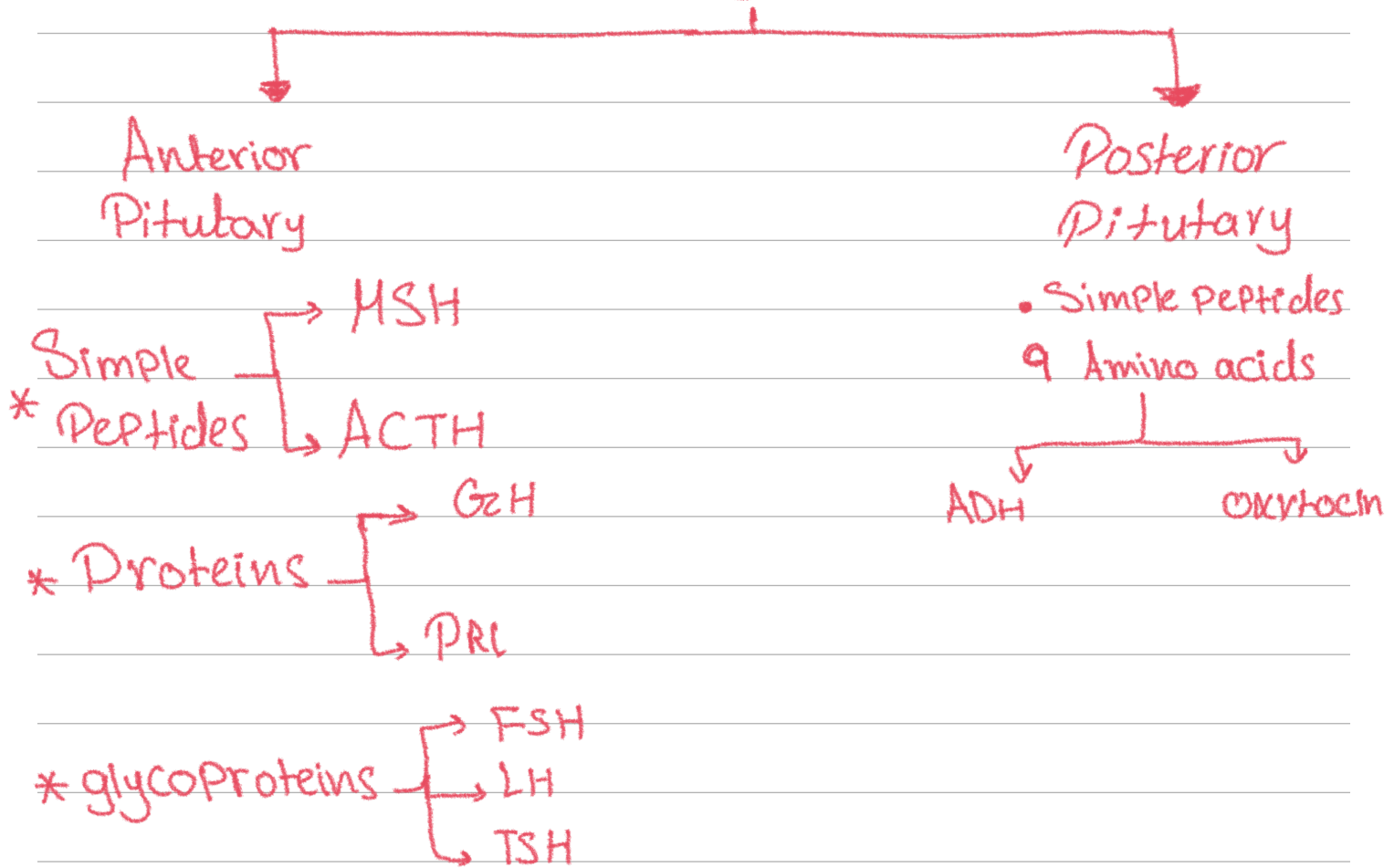
- Synthetic analogue for somatostatin.
- longer $\frac{1}{2}$ than S.S

USES \rightarrow

- A) Acromegaly (\uparrow GzH) ^{means}
- B) Carcinoid Syndrom (\downarrow Seratonine) ^{by}
- C) Insulinomas + gastromas (\downarrow Insuline) ^{by}
- D) Esophageal Varices (\uparrow Platelet aggregation) ^{by}
- E) D.M

Side effect \rightarrow gall bladder stones + Platelet abnormality

Pituitary hormones



* ↑ Hypothalamous → ↑ Anterior Pituitary Hormones
↓ Hypothalamous → ↓ Anterior Pituitary Hormones
Except Prolactine

← under inhibitory stimulation →

↑ Hypothalamous → ↓ Prolactine

↓ Hypothalamous → ↑ Prolactine

ذكي عن هورونات A.P.G بالتفصيل

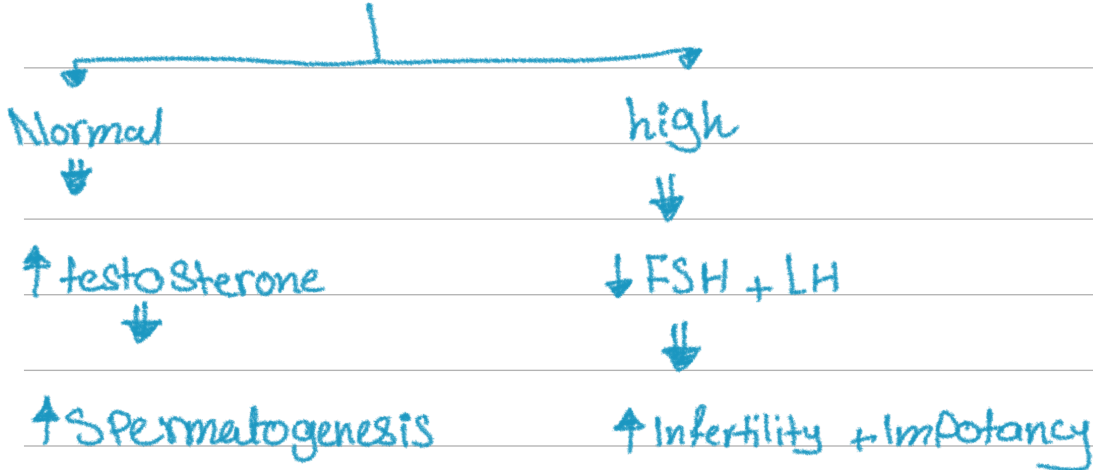
① TSH → glycoprotein / Use ^{→ diagnostic use} → ↑ T₃ + T₄ Synth. + release
 by → A) Intracellular cAMP
 → B) ↑ Iodine uptake [Iodination and hydrolysis of thyroglobin]

② ACTH → derived from larger precursor / ↑ increase cortisol / Circadian rhythm (diurnal effect) ↑ morning / Use ^{→ diagnostic use I.V or I.M}
^{pro-opiomelanocortin} → Adrenal Insufficiency Cases

Acthar and cosyntropin (tetracosactrin + tetracosactide + cortrosyn) are synthetic analogs

③ Prolactin → Synthesized from Anterior Pituitary or Placenta / GH like activity (similar chemical structure) / Dopamine main reg.

In Males Prolactin Level



In females effects are more obvious

- ↳ breast development (puberty or pregnancy)
- ↳ Lactation (Milk Synthesis)

Note PRL → Milk Synthesis
 Oxitocin → Milk ejection

PRL → ↓ FSH + LH → galactorrhea amenorrhea syndrome

* Factors that Stimulates PRL

Pregnancy, Sleep, nursing, Stress (surgery, exercise), TRH, Estradiol, DA antagonist (antipsychotics), Methyldopa, reserpine, diazepam, opiates, imipramine, meclizine.

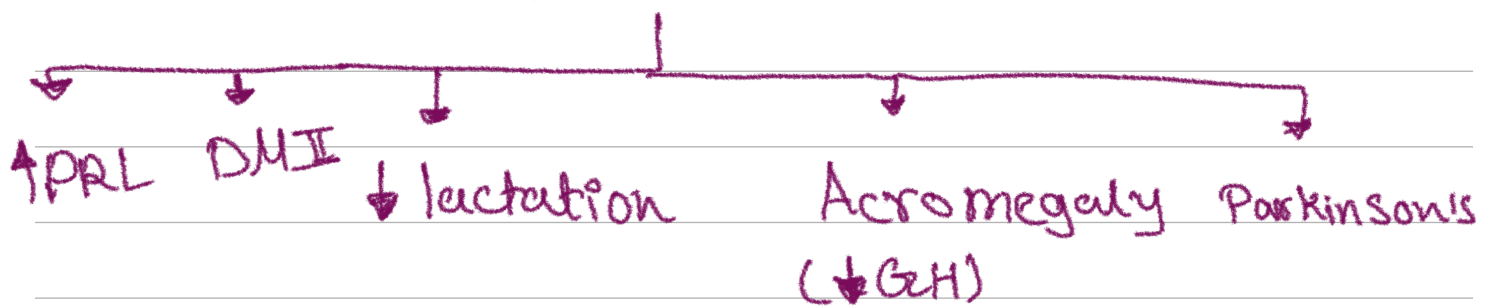
Note that it's hard for addicts to get pregnant due to \uparrow PRL

* Factors decrease PRL

DA agonists (Bromocriptine, Pergolide, levodopa), apomorphine, clonidine, MAO inhibitors (paroxetine).

* PRL doesn't cross BBB.

Dopamine uses



* Bromocriptine is DA agonist, it's given orally

Side effects • Rare

Pulmonary fibrosis, confusion, myocardial infarction

④ GH Hormones → differ between human and animals; so we can't use animal's GH / PPI like activity.

* MOA. GH → IGFs (Somatomedin)

In liver, kidney, muscles ↙

* → ↑ growth of soft tissue and cartilage
→ ↑ lipolysis
→ ↑ gluconeogenesis
→ ↑ glucose utilization (↑ blood sugar)

* Factors stimulates GH

Sleep, Insuline, hypoglycemia, Arginin, Badrenergic antagonist
Clonidine, Bromocriptine and levodopa In normal individuals.

* Factors inhibits GH → Bromocriptine in acromegaly
- Somatostatin analogs.

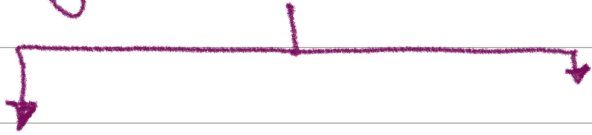
* Disorders affecting GH secreting cells *

1] Hyper Secretion (Gigantism in children + Acromegaly in adults).

How to treat it?

- ① Surgery (removal of P.Gz + give replacement to GH)
- ② Somatostatin analogs
- ③ Dopamine agonist
- ④ Pegvisomant → It has sever side effects
↓
GH receptor antagonist
① abnormal liver enzyme
② ↑ pituitary GH secreting tumors.

2 Hypothyroidism



Children

Adults ← Less Common

[dwarfism]

• Short (neck, trunk
arms, legs)

• ↑ fat ↓ around waist

• Anxieties, depression

• ↓ Sexual func. + interest

• Average hands and feet

• ↓ muscle mass

• rounded chest

• fatigue

Treatment

GH replacement

Treatment

lifestyle modification

± GH replacement



↑ side effect on C.V.S

GHRT... Successful in dwarfism / S.C or I.M

- recombinant GH

① Somatotropin (Humatrope)

② Somatrem (Protropin)

- recombinant IGF-1 (Mecasermin)

Mecasermin rebinbate

IGF-1 + IGF binding Protein 5 = IGF BP 5

• given S.C to dwarfism with ↓ IGF and not responding to GH

There are many side effect rHGHT so we give it in small dose
go to the last slide to memorize the side effects ;)

