FIBROBLAST GROWTH FACTOR- 23

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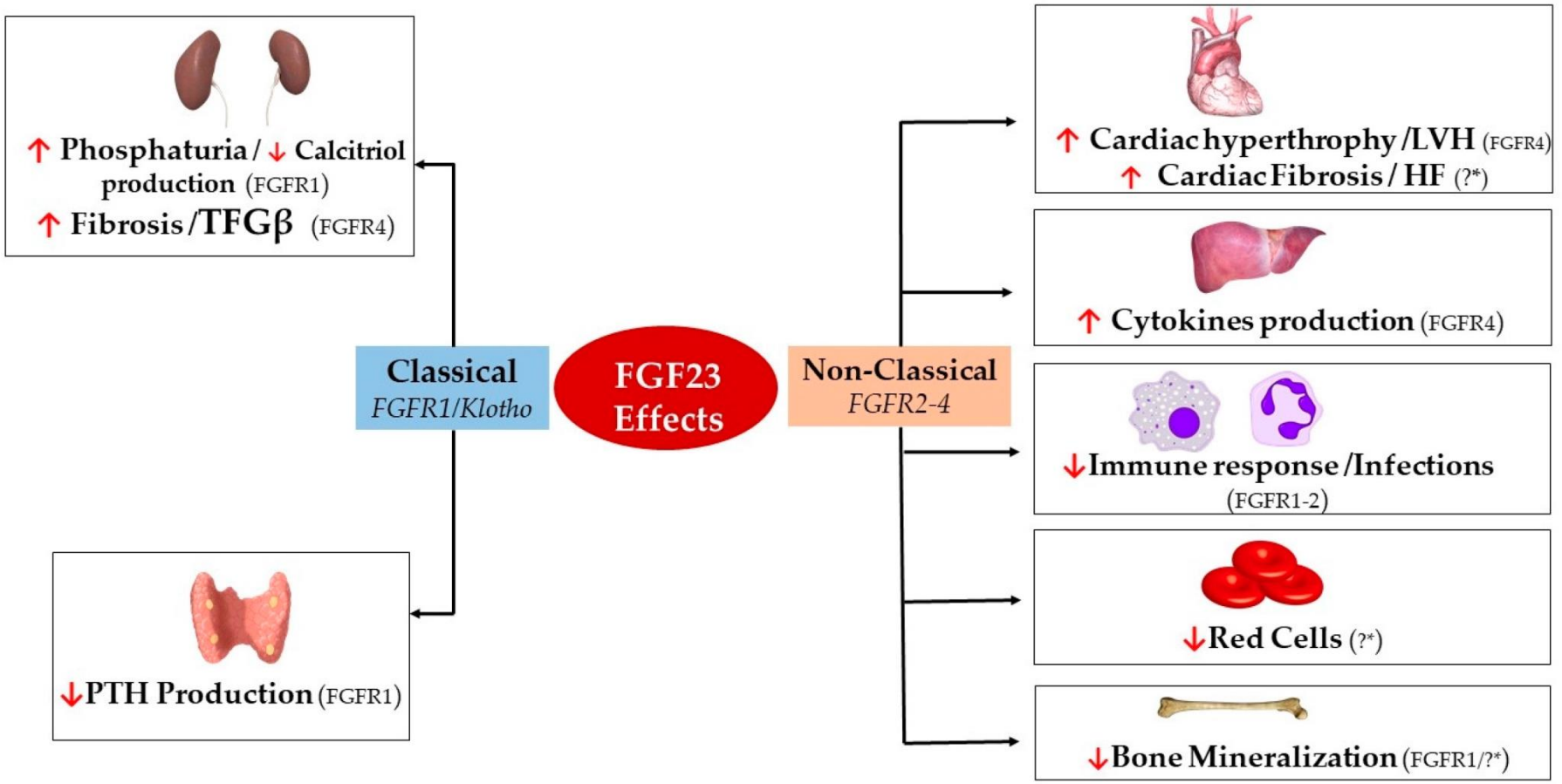
ACADEMIC CORDINATOR -ECNG

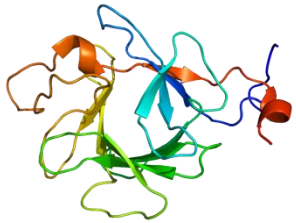
INTRODUCTION

- Fibroblast growth factor 23 (FGF23) is a bone-derived hormone that functions as the central endocrine factor that regulates phosphate balance.
- FGF23 is mainly produced by osteocytes and osteoblasts.
- FGF23 concentrations are measured by sandwich ELISA.
- The reference range of MED FGF23 levels among healthy controls was 18.6–59.8 pg/mL when calculated as the average ± 2 standard deviations (SDs).

FGF 23 - HORMONE /BIOMARKER



Effect of FGF23 in different organs and cells.



↑ Synaptic density
Morphological changes

↑ Inflammation
↑ IL-6
↑ CRP

↓ PTH

FGF23

↑ P_i excretion
↓ $1,25(OH)_2D_3$ production

↑ Inflammation

↑ ROS, NO
LVH

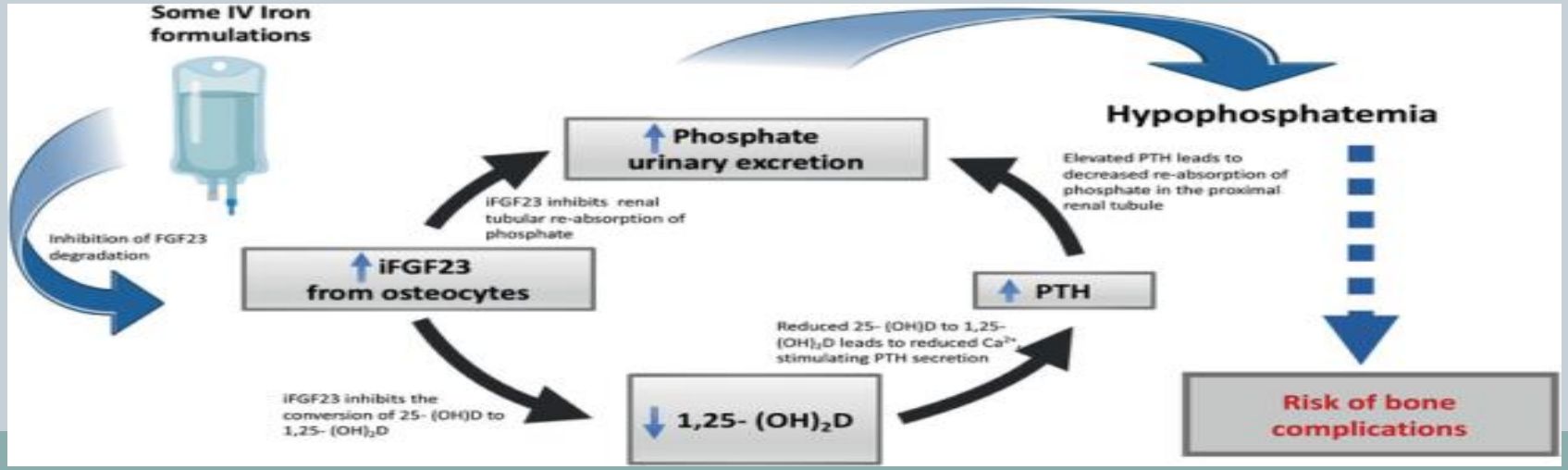
↑ TNFα
↓ $1,25(OH)_2D_3$
↓ Neutrophil recruitment

PATHOLOGICAL EFFECTS

- Acute kidney injury leads to increased FGF23 levels.
- In chronic obstructive pulmonary disease, FGF23 is elevated.
- Urothelial , ovarian and Colon adenocarcinoma and are characterized by FGF23 secretion with hypophosphatemia.
- Cardiovascular: left ventricular hypertrophy, aortic calcification and atrial fibrillation in CKD.
- Brain: hemorrhagic stroke.
- Associated with increased insulin resistance.
- Hyperphosphatemic disorders due to loss of function and resistance to FGF-23.
- Hypophosphatemic disorders due to mutation leading to lack of cleavage of FGF -23.

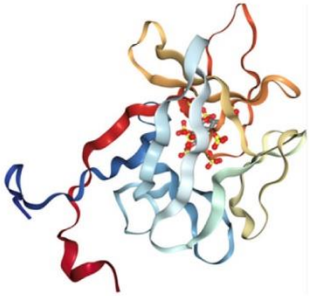
FGF 23 and IV IRON RX

- In the absence of CKD, iron deficiency is associated with an elevation of C FGF-23.
- Treatment of iron deficiency with intravenous iron lowers cFGF23 on a transcriptional level.
- Ferric carboxymaltose increases iFGF23 due to an inhibitory effect on its degradation and leads to hypophosphatemia.

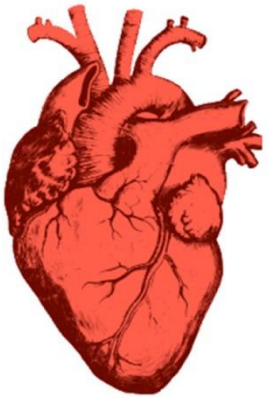


IV IRON –FCM AND FGF 23

Ferric carboxymaltose



Fibroblast growth factor 23 ↑



Maladaptive cardiac hypertrophy

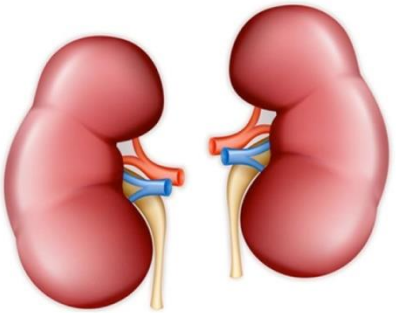
↓

? Worsening heart failure

↑ Phosphaturia

↓

? Osteomalacia



NEWER AGENT

- Burosumab is an antibody against FGF23 that is approved and therapeutically used in the treatment of X-linked hypophosphatemia.