

Ms. Try-Methoprim: A Case Study on Antibiotic Desensitisation for PJP prophylaxis

Jack Kinsella BPharm(Hons) ^{1,2}

¹ Pharmacy Department, Princess Alexandra Hospital, Queensland, Australia



² Royal Australian Air Force, Queensland, Australia

Ms. Try-Methoprim

- 40-year-old female.
- T1DM → end-stage diabetic nephropathy → kidney transplant in 2019.
- Allergies: Bactrim - trimethoprim/sulfamethoxazole (rash).

Goal

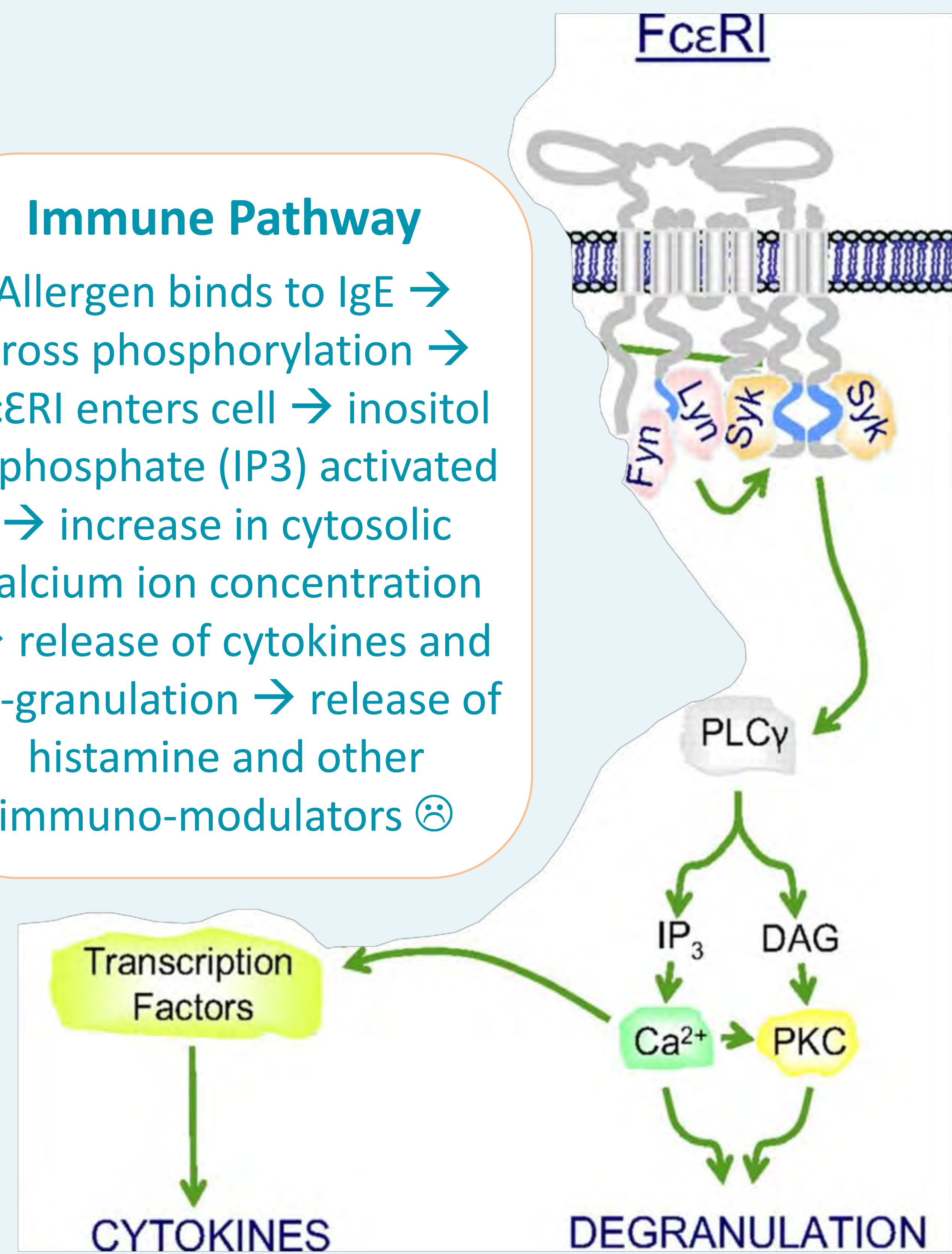
To complete a trimethoprim/sulfamethoxazole desensitisation to ensure the patient can commence on first line PJP prophylaxis.

Why?

- Immunosuppressed patients are at high risk of PJP.
- Mortality rates are as high as 30-50%!
- TMP/SMX has the best evidence as the most efficacious option.
- Second line options are less efficacious, have more side effects and are more expensive.

Immune Pathway

Allergen binds to IgE → cross phosphorylation → FcεRI enters cell → inositol triphosphate (IP₃) activated → increase in cytosolic Calcium ion concentration → release of cytokines and de-granulation → release of histamine and other immuno-modulators ☹️



The Process

An 18-step desensitisation plan was compounded by a pharmacist and completed over 5 hours.

Outcome

The patient has now been on Bactrim for over 4 years with no issues.

Pharmacy Counselling

Compliance is key! Always ensure they have enough stock, especially if it is short in the community.

A Desensitised Mast Cell

1. FcεRI complexes cluster together inhibiting internalisation.
2. The actin cytoskeleton within the cell is remodeled to a highly stable form. This is a negative regulator of calcium mobilization, preventing calcium release and in turn, preventing histamine release
3. When the dose or antigen valency is too high, the clusters form large aggregates which then internalise and initiate the immune pathway.

FUN FACT

PJP is often mislabelled as a bacteria, but it is actually a fungus!

Dose #	Time (mins)	Route	Strength (mg)
1	15	PO	0.005/0.001
2	30	PO	0.01/0.002
3	45	PO	0.02/0.004
4	60	PO	0.04/0.008
5	75	PO	0.08/0.016
6	90	PO	0.16/0.032
7	105	PO	0.32/0.064
8	120	PO	0.64/0.128
9	135	PO	1.2/0.24
10	150	PO	2.4/0.48
11	165	PO	4.8/0.96
12	180	PO	8/1.6
13	195	PO	16/3.2
14	210	PO	32/6.4
15	225	PO	64/12.8
16	240	PO	128/25.6
17	255	PO	256/51.2
18	270	PO	400/80