CAR –T CELL THERAPY AND AKI

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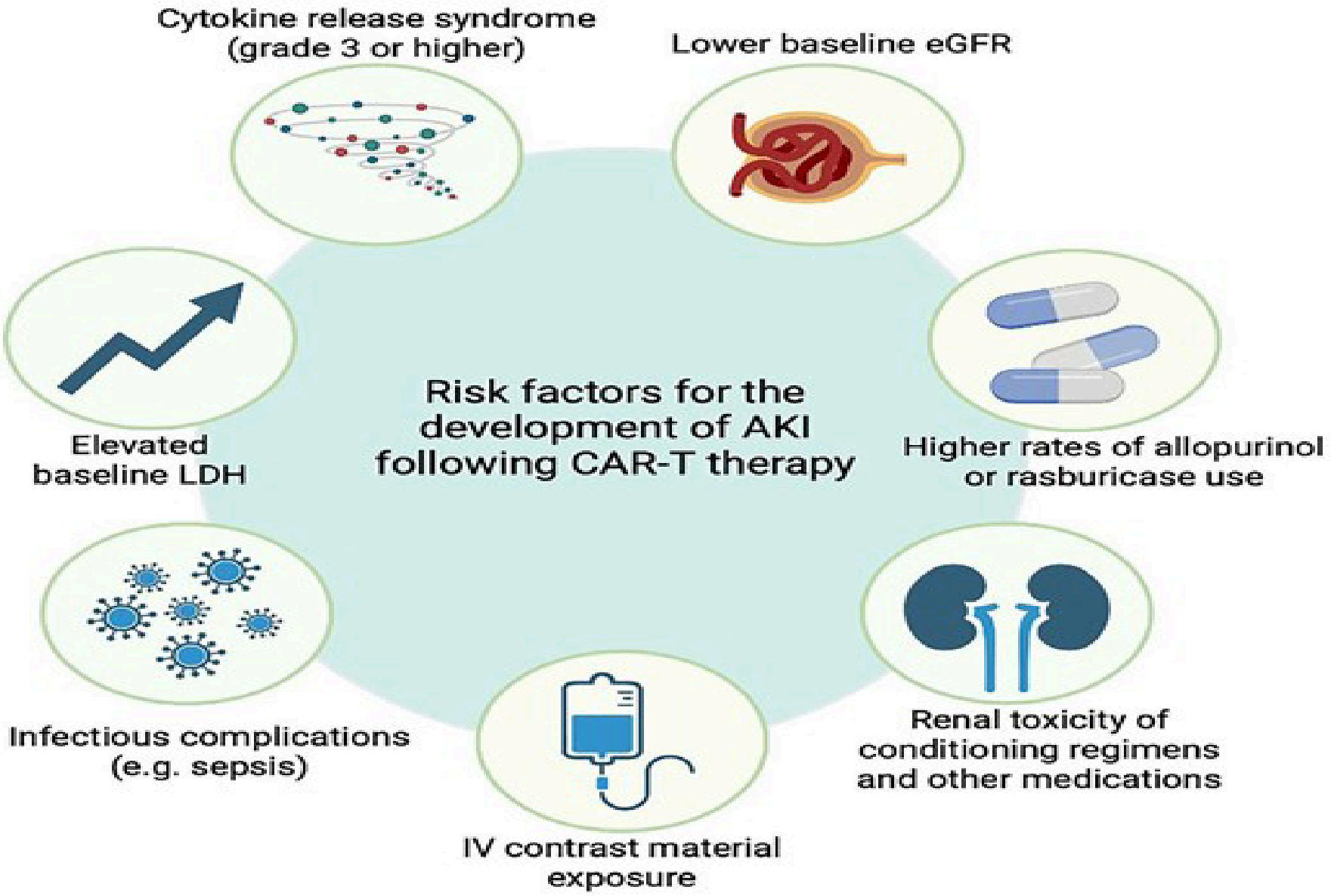
INTRODUCTION

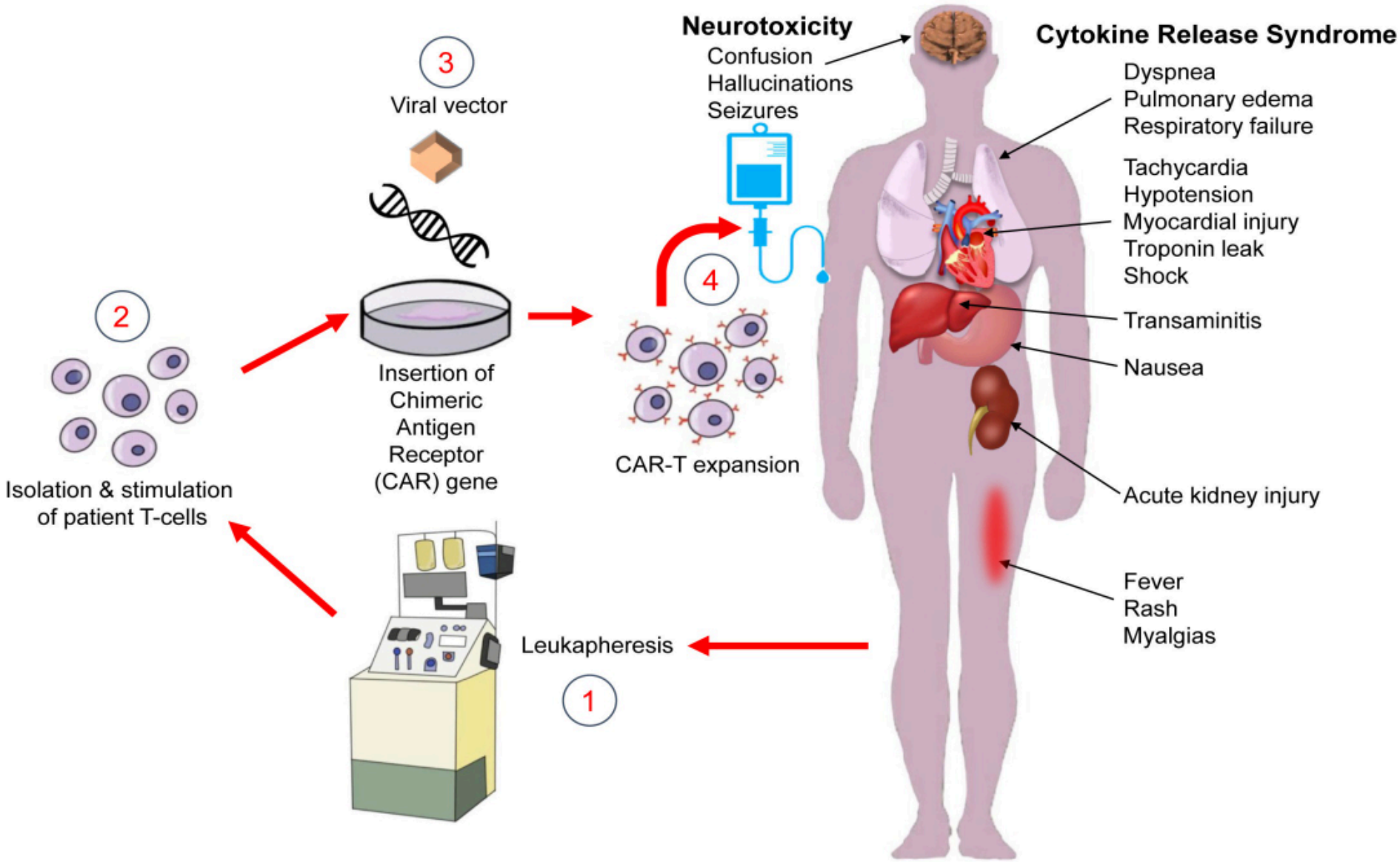
- Chimeric antigen receptor T (CAR-T) cell therapy, personalized immunotherapy for various hematologic malignancies, autoimmune diseases and other conditions, involves the modification of patients' T cells to express a chimeric antigen receptor that recognizes tumour or autoimmune cell antigens, allowing CAR-T cells to destroy cancerous and other target cells selectively.

- Studies report AKI incidence following CAR T-cell therapy ranging from 5% to 46% - cumulative incidence of any grade AKI around 30% within 100 days post-infusion.

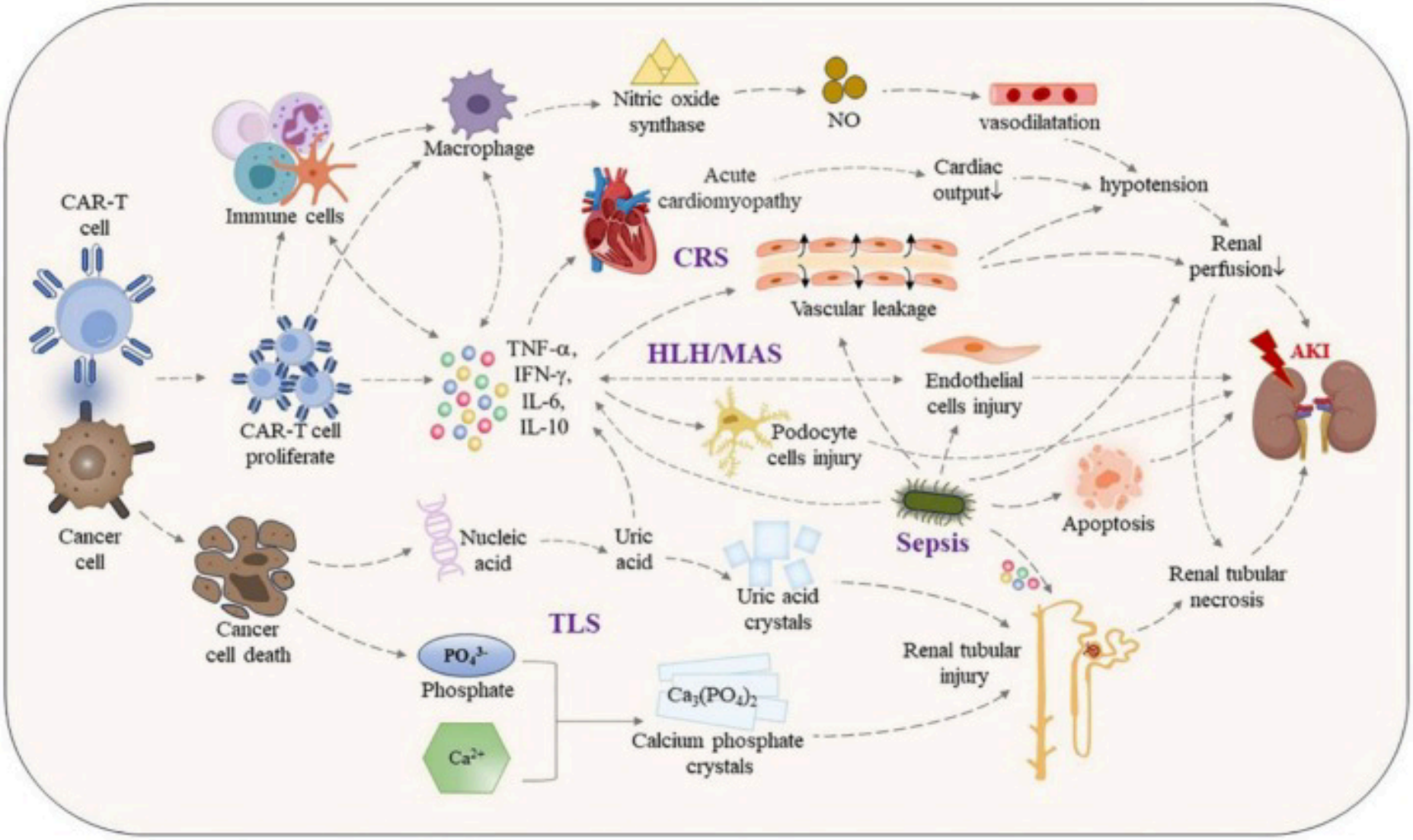
RISK FACTORS



CAR T CELL THERAPY –PREPARATION AND COMMON SIDE EFFECTS



MECHANISM OF AKI WITH CAR T CELL THERAPY



AKI and Electrolyte Abnormalities After CAR-T Therapy

Setting & Participants

Case Series (2017-2019)

78 hospitalized patients in 2 cancer centers

Diffuse large B-cell lymphoma

Chimeric antigen receptor T-cell therapy

Findings

Acute kidney injury	19%
Cytokine release syndrome	85%
↓Na (<135 mEq/L)	75%
↓K (<3.5 mEq/L)	56%
↓PO_4 (<2.5 mg/dL)	51%

CONCLUSION: Cytokine release syndrome, AKI, hyponatremia, hypokalemia, and hypophosphatemia are common after CAR-T therapy

Shruti Gupta, Harish Seethapathy, Ian Strohbehn, et al (2020)

@AJKDonline | DOI: 10.1053/j.ajkd.2019.10.011

AJKD AMERICAN JOURNAL OF KIDNEY DISEASES

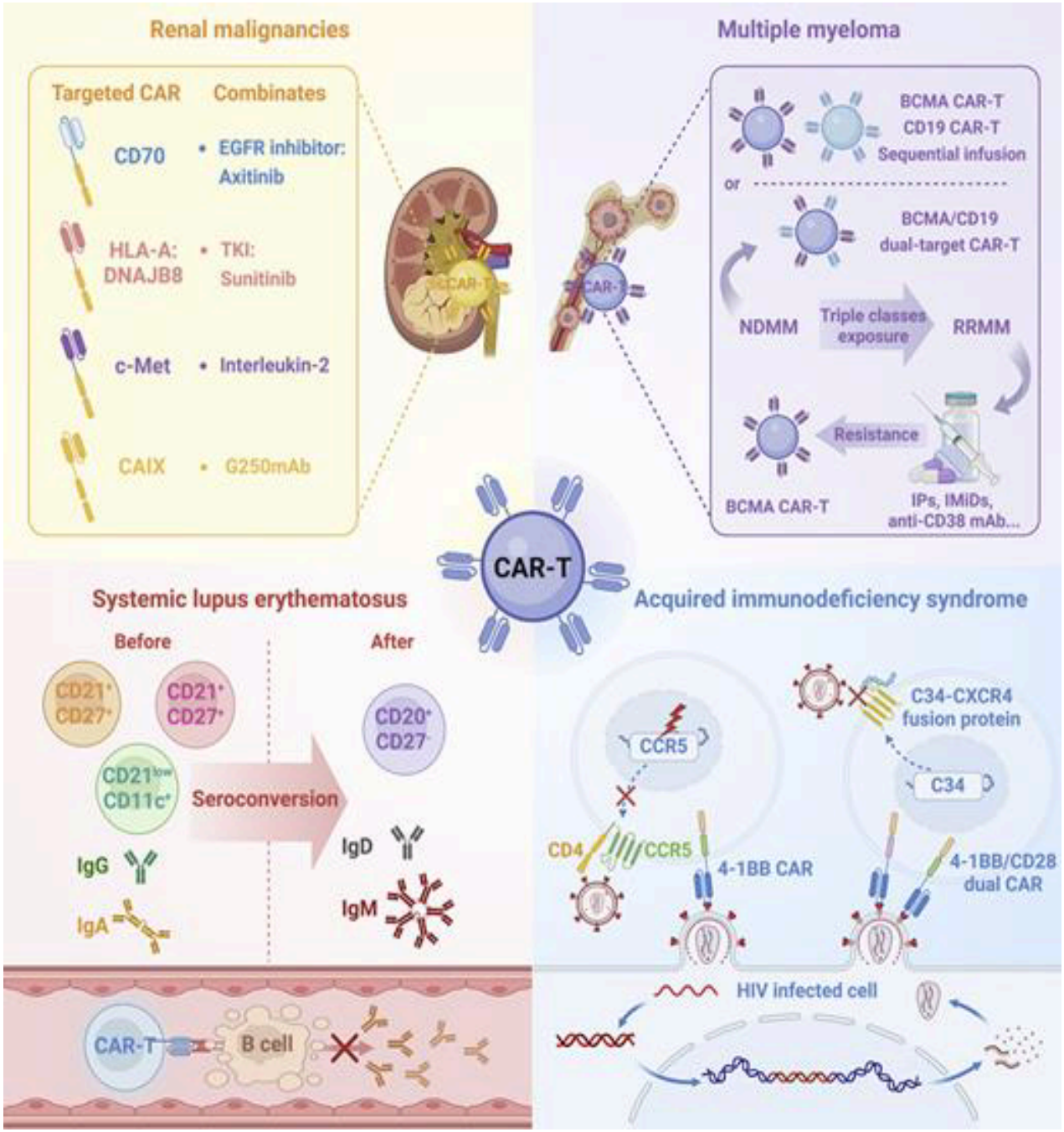
Electrolyte disorders seen with CAR T cell therapy -The most common was hypokalemia (47%), followed by hypophosphatemia (37%), and finally hyponatremia (5%).

TREATMENT

- Cytokine storm-related toxicities :
- 1.anti-cytokine therapy such as anti-IL-6 agent tocilizumab. It can quickly reverse the cytokine storm in most patients.
- 2.Methylprednisolone 1–2 mg/kg intravenous every 12 hours can be tried in cytokine release syndrome that is refractory to tocilizumab.
- 3.Pretreatment with chemotherapy to reduce tumor burden and steroids is also considered to be important in the prevention of cytokine release syndrome.

TREATMENT

- Tumor lysis related AKI : aggressive hydration , Rasburicase , dialysis in refractory and severe cases.
- Sepsis : antibiotics , fluids and vasopressors.
- Discontinue nephrotoxic drugs.
- Electrolyte correction.
- Renal replacement therapy [RRT] whenever indicated.



CAR-T CELL THERAPY IN OTHER CONDITIONS