

Combined Inhibition Of Complement & Leukotriene Pathways To Treat Inflammatory Diseases



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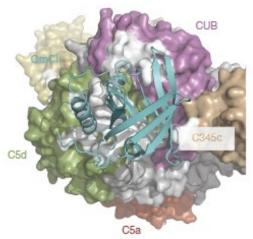
Akari Overview Targeting Inflammatory Diseases With Unmet Need



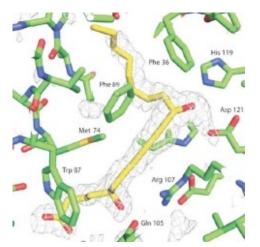
- First in class, differentiated, dual MOA within the complement mediated disease space:
 - Nomacopan inhibits complement C5 and leukotriene B4 (LTB4)
 - Ability to target multiple inflammatory indications where inhibiting both
 proinflammatory mediators may be more effective than treating either pathway alone
- Positive clinical and safety data with two Phase 3 clinical studies in 2021:
 - Bullous Pemphigoid a severe dermatological orphan condition
 - Pediatric HSCT-TMA an ultra orphan indication and gateway into broader TMA space
- Development pipeline:
 - Ophthalmic large markets with partnering upside in both back of eye and topical indications
 - Pulmonary multiple potential targets with high unmet need

First-In-Class Bifunctional Anti-Inflammatory Biological





Top view of nomacopan (Cyan) bound to C5 Jore et al., Nat Struct Mol Biol. 2016



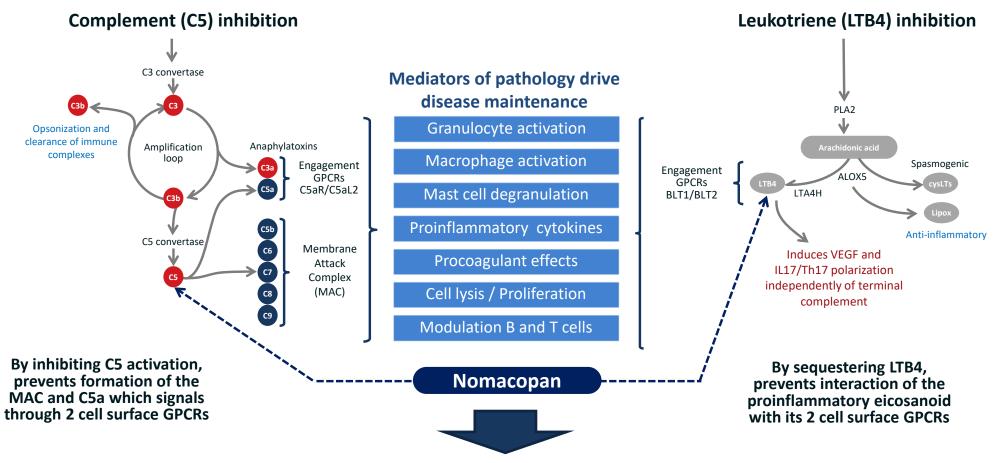
Detail of nomacopan binding to LTB4 Roversi et al., J Immunol. 2013

Two Modes of Action

- Nomacopan, by binding C5 and LTB4, inhibits both complement and leukotriene immune pathways, which are both active in a wide range of inflammatory disorders
- Inhibits complement C5 activation in a similar way to eculizumab, but binds a different highly conserved region of C5 $(K_D < 1nM)$
- Unique* mode of action against leukotriene LTB4 by very tightly sequestering LTB4 within body of protein 'ligand capture' (K_D 0.13nM) thereby preventing receptor mediated cell activation

Nomacopan's Competitive Advantage: Synergistic Inhibition of Two Key Effectors Driving Autoinflammation



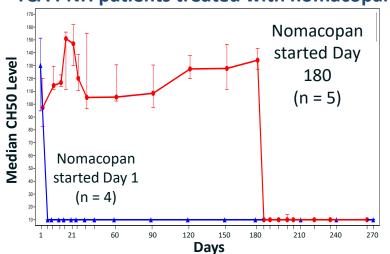


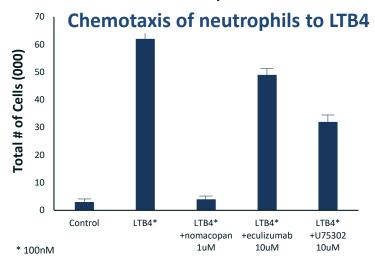
- Two independent but related activation pathways
- Both complement and leukotriene pathways active in multiple inflammatory diseases
- Nomacopan achieves additive, synergistic effect by inhibiting both

Nomacopan's Effectiveness Inhibiting C5 & LTB4 Demonstrated In PNH And Other Models



TCA PNH patients treated with nomacopan





Terminal complement inhibition demonstrated in PNH patients

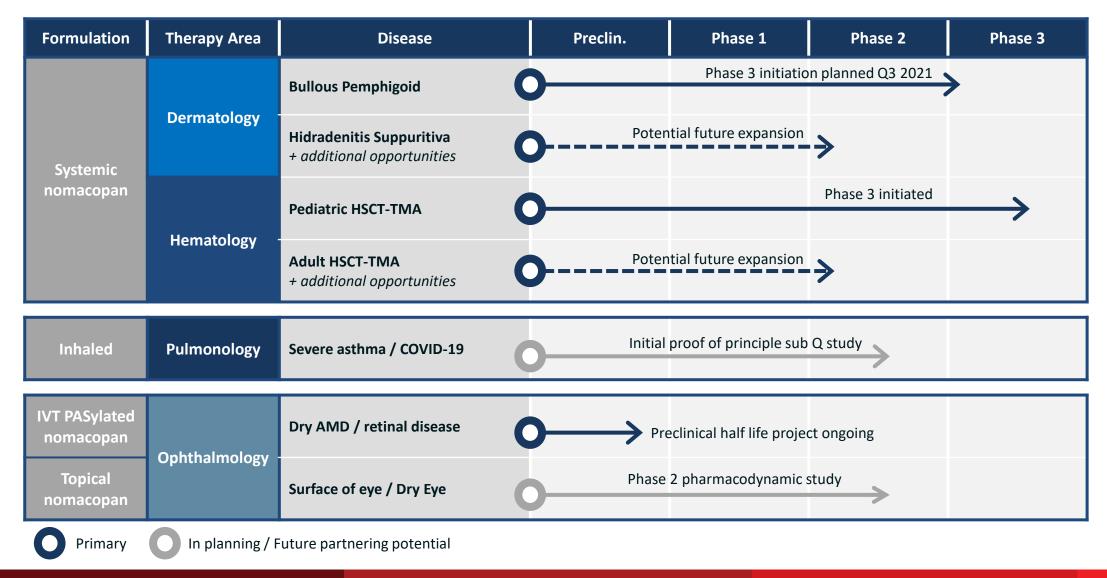
- **Drug effect:** Terminal complement activity (TCA) fully inhibited during long-term self-administration of nomacopan by PNH patients
- Efficacy: Nomacopan reduced transfusion dependence by 79% in 14 formerly transfusion dependent PNH patients treated for ≥6 months. Compares to 50-60% transfusion independence with eculizumab*
- Safety: Total of >35 cumulative patient years nomacopan exposure with only one reported possibly drug-related SAE (a urinary tract infection), no meningococcal infections, no major adverse vascular events

Binds LTB4, thereby preventing receptor-mediated cell activation

- **Drug effect:** Nomacopan significantly more effective in *ex vivo* model than U75302, another leukotriene inhibitor (U75302 is a BLT-1 receptor antagonist which is the high affinity receptor for LTB4)
- Brodsky et al., 2008, SHEPHERD study, Hillmen et al 2013 Phase III study of eculizumab and ravulizumab (Wook Lee et al., 2019) transfusion independence respectively increased from 21% to 66% of and 23% to 74% of patients over first 6 months of treatment

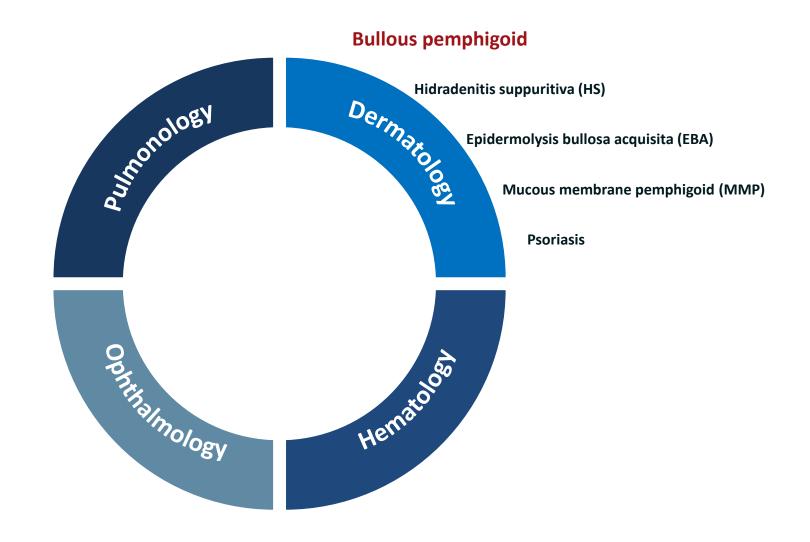
Clinical Pipeline Progressing Into Phase 3 Studies





Bullous Pemphigoid: Chronic Disease, No Specific Approved Therapies





Bullous Pemphigoid: Auto-Immune Blistering Disease With No Specific Approved Therapy



Unmet Need

High dose oral corticosteroid (OCS) use associated with approximately 3-fold increase in mortality in this patient group

Need for rapidly efficacious steroid-sparing therapy

Prevalence

Most common auto-immune blistering skin disease

- 120K patients in US+EU; 75% are moderate/severe
- Majority of cases in elderly

Cause

Auto-antibodies to epidermal basement membrane proteins leads to separation of dermis / epidermis

C5 & LTB4 initiate and maintain inflammatory drive in BP

Treatment

No specific approved therapies

Mod/severe patients: high dose OCS / superpotent topical steroids

Status

Phase 3 expected to commence mid 2021

Orphan and Fast Track status.

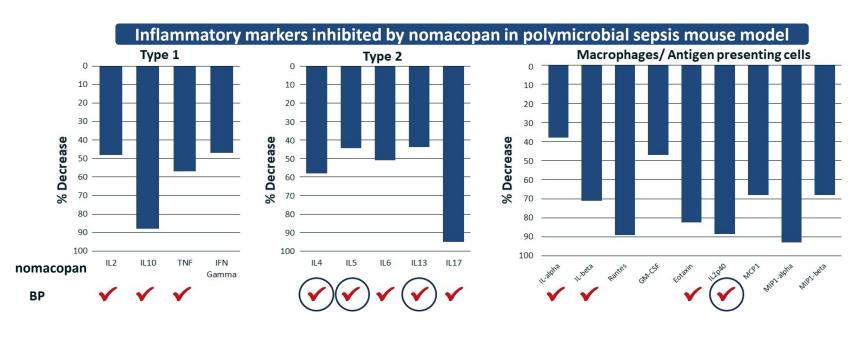




Central Role For C5 & LTB4 in Bullous Pemphigoid



- **Preclinical:** BP-like model of epidermolysis bullosa acquisita showed c.50% reduction in surface area affected by blisters by inhibiting LTB4 alone but c.80% reduction by inhibiting both LTB4 and C5
- Clinical biomarkers: C5 and LTB4 levels elevated in blister fluid from BP patients illustrating local activation of both pathways. Mean level of LTB4 in plasma of phase 2 BP patients more than 2.5-fold higher than in PNH patients



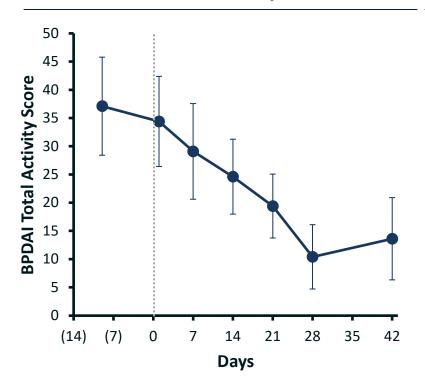
- Nomacopan inhibits multiple cytokines implicated in BP as well as the direct effector mechanisms of C5+LTB4 such as neutrophil and eosinophil activation
- Other drugs in development for BP primarily operate downstream of nomacopan, inhibiting specific cytokines/chemokines or immunoglobulins
- Dupilumab (Dupixent) inhibits IL-4 & IL-13 and benralizumab (Fasenra) inhibits IL-5, and ustekinumab (Stelara) inhibits IL12 and IL23 (via IL12p40). See left ()

Phase 2 Outcome: Rapid Reduction in BPDAI Activity Scores of 7 Responders On Nomacopan

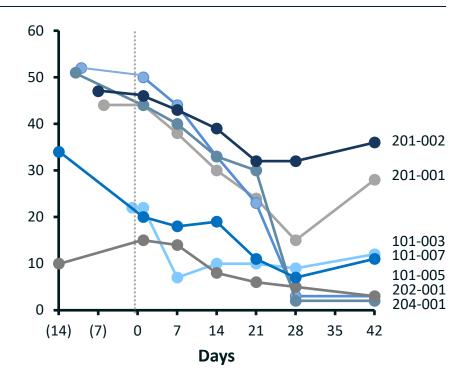


Single arm (n = 9); 42 days treatment; mild - moderate active BP; endpoints safety (primary) and BPDAI/QoL at Day 42

Mean BPDAI Activity + 90% CI



Individual Patients BPDAI Activity



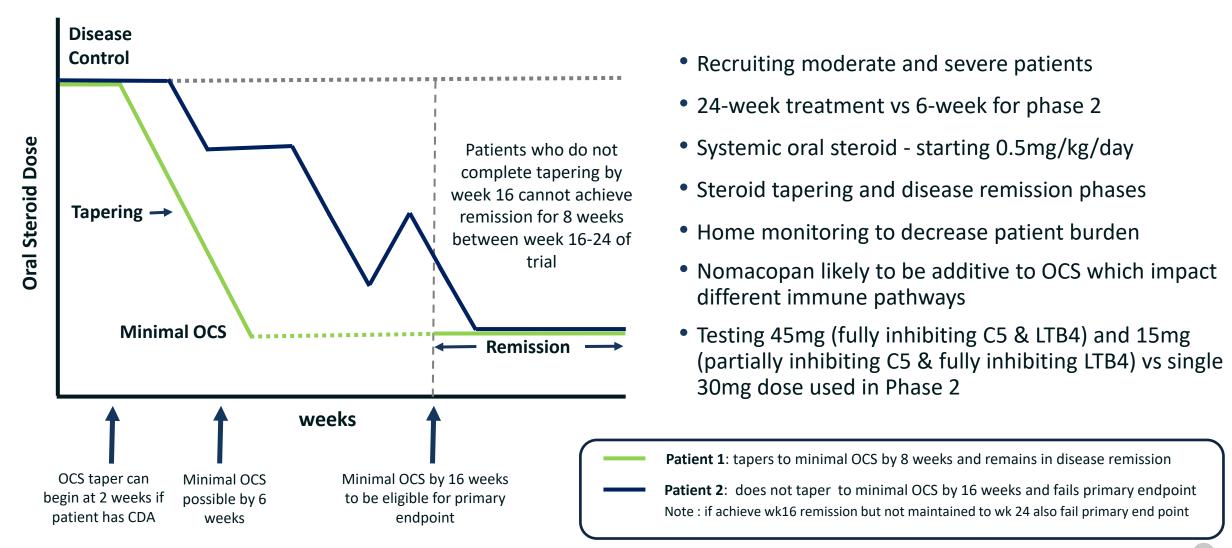
Phase 2 Observations

- Rapid clinical response
- 7 of 9 patients were responders
- Clinical response similar to potent oral steroids
- Indication of remission within 6 weeks of treatment
- No reported grade 3, 4 or 5 treatment-related Adverse Events
- Supports Phase 3 design of rapid steroid tapering

- All prior treatment, including steroids, withdrawn circa one week prior to initiation of treatment with nomacopan
- Addition of <30g/week low dose 0.1% llesional mometasone, a moderate topical steroid, was permitted from study initiation through Day 21. Mometasone may stabilize mild BP but is not sufficiently potent to control moderate or severe BP

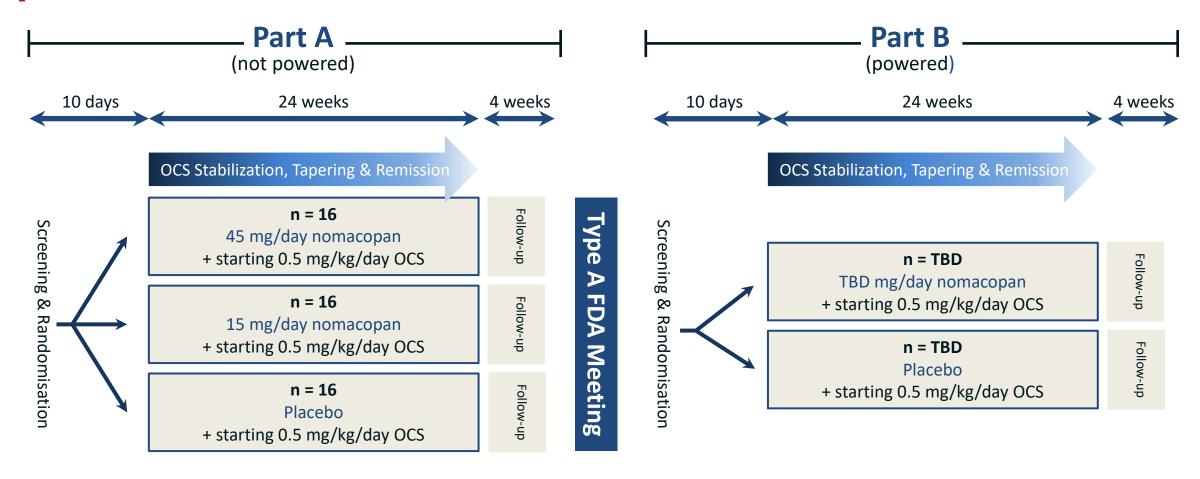
BP Phase 3 Design – Visual Summary





BP Phase 3 Design Provides Interim Readout After Part A



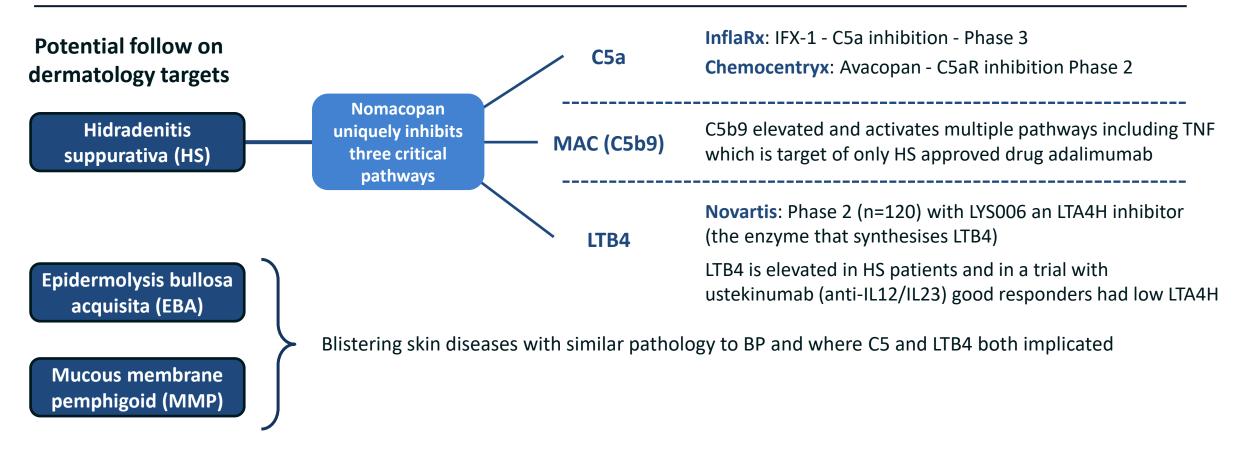


Primary endpoint: Achievement of Complete Disease Remission (Cr_{on}) on minimal OCS therapy (0.1mg/kg/day) for 8 weeks or more by Week 24

Broad Applications Across Dermatology



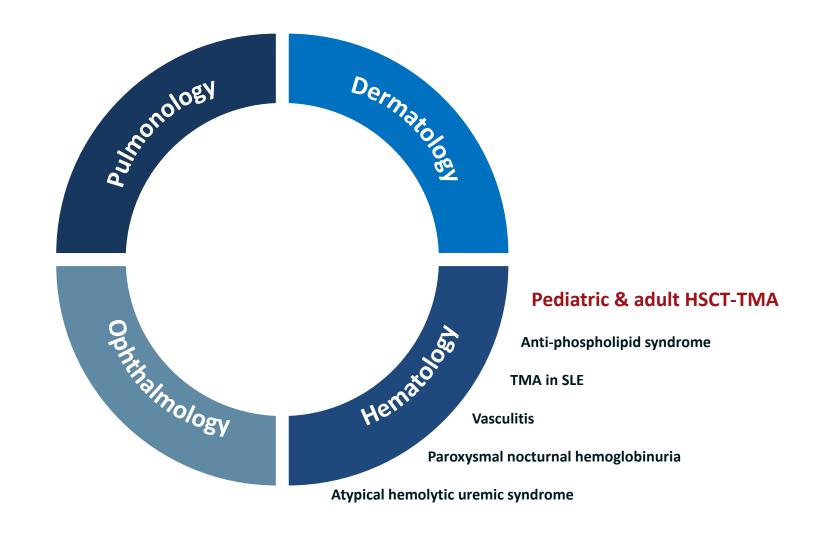
Multiple market opportunities with \$bn+ aggregate peak sales where both C5 and LTB4 implicated



HS: Other mediators being directly targeted include IL17, IL23, IL1alpha and CXCR1/2 which are downstream to and likely to be inhibited by nomacopan (in addition to its direct effect on C5 and LTB4 REFERENCES: Kanni et al., 2018: Complement activation in hidradenitis suppurativa; Frew et al., 2019: Topical, systemic and biologic therapies in hidradenitis suppurativa; Penno et al., 2020: Lipidomics profiling of hidradenitis suppurativa skin lesions reveals lipoxygenase pathway dysregulation and accumulation of proinflammatory leukotriene B4; Blok et al., 2016: Ustekinumab in hidradenitis suppurativa

HSCT-TMA: High Clinical Impact, No Approved Therapies





HSCT-TMA (Pediatric & Adult): Potential To Reduce Mortality In Aggressive Disease



Unmet Need

High mortality rate of up to 80% associated with severe pediatric HSCT-TMA

Need for rapid, complete & sustained C5 & potentially LTB4 inhibition

Prevalence

~10K pediatric HSCT and ~60K adult HSCT performed in US + EU annually

- TMA diagnosed in up to 30% of HSCT
- 50% of the HSCT-TMA cases are severe

Cause

Vicious cycle of inflammation leads to progressive organ damage and death

- Complement activation leads to endothelial tissue injury, a prothrombotic state
- LTB4 shown to impact GVHD progression and activate endothelial surfaces and neutrophil extracellular traps (NETs) exacerbating prothrombotic state and elevating inflammation

Treatment

No approved therapies (SOC transfusions and immunosuppressants)

Off-label use of eculizumab especially in US – used at higher dosing level than in PNH

Status

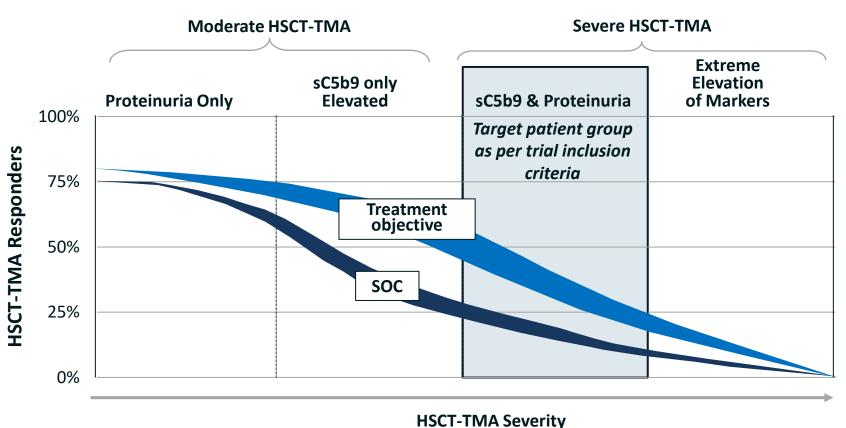
Phase 3 study ongoing in pediatric population

Orphan and Fast Track status

Pediatric HSCT-TMA Phase 3 Program Goals: Transfusions, Renal Function, Survival



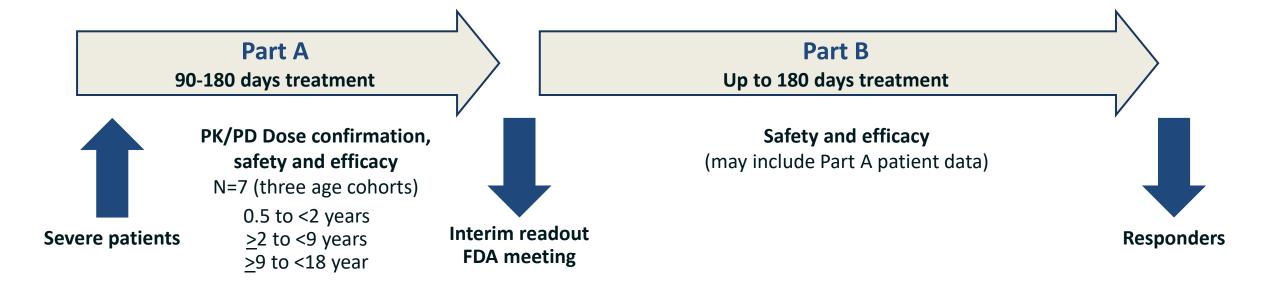
Conceptual Treatment Profile



- Targeting severe HSCT-TMA with elevated sC5b9 and proteinuria
- Early diagnosis and intervention critical to optimize responder outcomes
- Target population *c*.50% of patients with HSCT-TMA
- Treatment goals
 - Decrease transfusions
 - Renal improvement
 - Increase survival

Pediatric HSCT-TMA Open-Label Phase 3 Study:





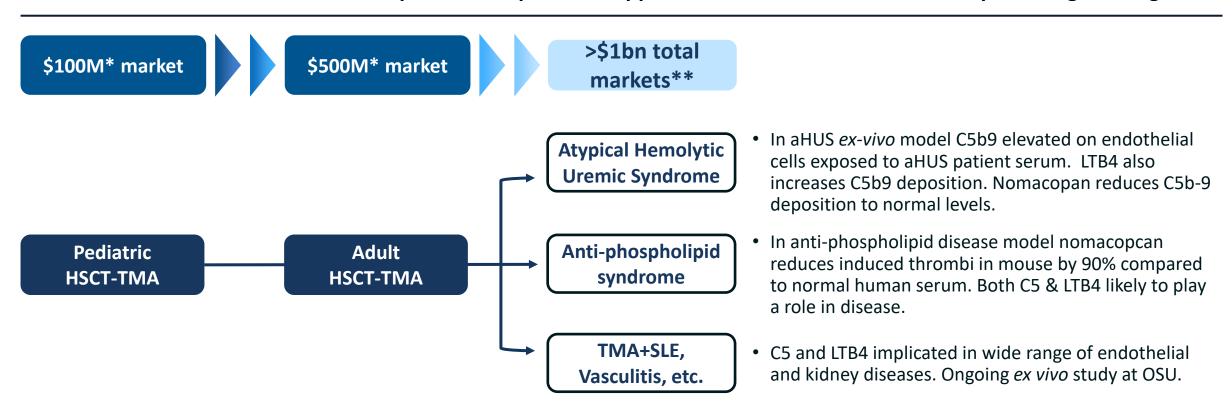
Primary Endpoints

- Response-based end point
- Reduced transfusion dependence and renal improvement

Broad Applications Across Hematology Revenue Potential > \$1 Billion



Success in HSCT-TMA leads to multiple follow-up market opportunities where role for nomacopan being investigated



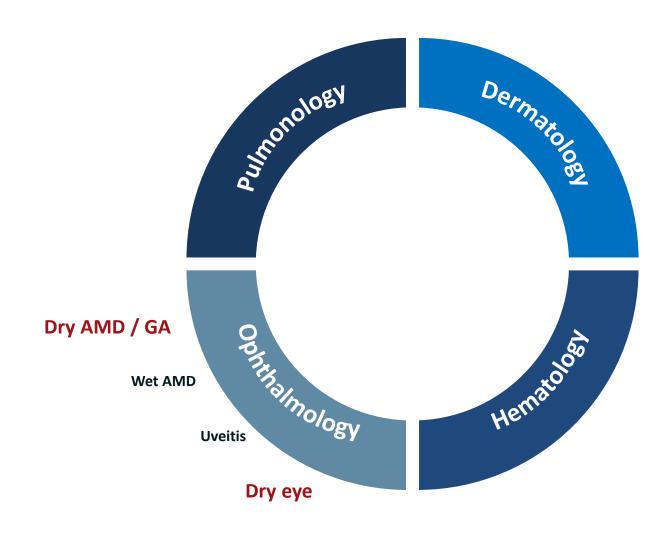
^{*} US and EU5 markets only

Note: market size projection are company estimates based on existing treatments and prevalence

^{**} Initial and follow-on indications; company sources

Ophthalmology Program In Dry AMD/GA & Dry Eye Large Markets, Partnering Opportunities





Ophthalmology Programs: Partnering Potential



Surface of the eye - Topical

Clinical:

- Several positive pre-clinical studies demonstrated rapid onset and effect equivalent to cyclosporin
- LTB4 elevated in tear fluid, C5 and LTB4 in conjunctiva
- AKC Phase 1/2 study showed no ocular treatment SAEs and nomacopan was comfortable and well tolerated



Dry eye and related diseases

More severe patients poorly treated
\$3bn + market
Exploring phase 2 program

Back of Eye (intra vitreal)

Preclinical:

- C5 & LTB4 receptors both identified in retina
- In EAU* model, PAS-nomacopan** significantly reduced inflammation; comparable to dexamethasone
- Inhibition of LTB4 significantly reduces VEGF production the primary treatment for Wet AMD



Dry AMD

No approved treatment

\$5bn + market

Ongoing work confirming injection interval

Note: market size projection are company estimates based on existing treatments and prevalence

Historical



^{*} EAU: Experimental Autoimmune Uveitis

^{**} PAS-nomacopan: PASylated nomacopan with longer half-life

PASylated-Nomacopan (Long-Acting) Provides Unique Treatment Approach In Back Of Eye Inflammatory Indications



Current Unmet Need

Nomacopan

Unique MOA

- Geographic Atrophy (GA): no approved therapy treatment
- Dry AMD is estimated as a \$5+ billion market opportunity

Cell activation/damage Degeneration of retinal pigment epithelial cells Inflammasome activation Risk of conversion to Wet AMD

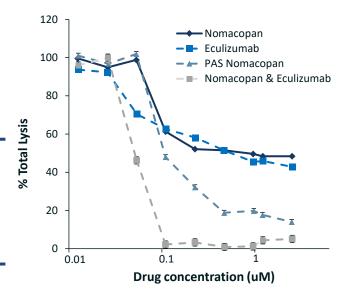
Extended Dosing

- Potential for low injection frequency and higher efficacy
- PAS-nomacopan: actual MW of 68kDa; apparent MW of >600kDa
 greatly extending half life without reducing C5 or LTB4 binding

PAS-nomacopan Properties

- Manufacturing established
- Acute IV toxicity complete
- Activity demonstrated in preclinical models

Inhibition of complement alternative pathway rabbit red blood cell lysis

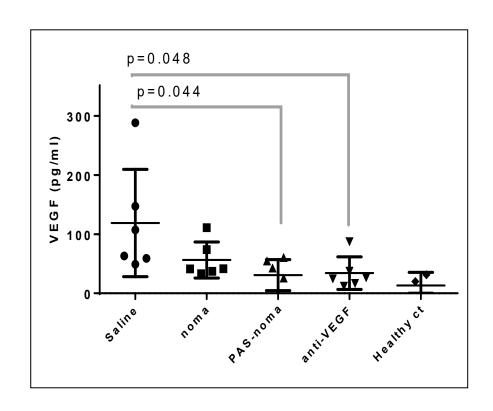


IVT Nomacopan: Role Of C5 & LTB4 Established In Ocular Inflammatory Conditions



Nomacopan and PAS-nomacopan

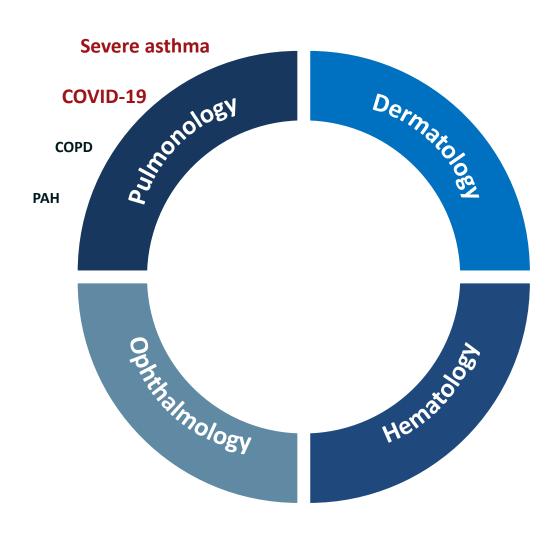
Effect on VEGF levels in mouse eye inflammation



- In mouse eye inflammation model (1, 2)
 - Significant VEGF reduction by PAS-nomacopan, equiv. to anti-VEGF
 - Additionally retinal inflammation reduced by 58% & 42% with PAS-nomacopan, versus saline & anti-VEGF respectively
- In choroidal neovascularisation (CNV) model
 - PAS- nomacopan (single dose) reduced neo-vascularisation in line with Eylea® (four doses), a VEGF inhibitor treatment for wet AMD
- Ongoing rabbit study with PAS-nomacopan to determine optimal dose interval for IVT injection
 - Quantify PAS-nomacopan in vitreous, choroid and retina after single IVT dose
 - Safety and histology
- Opportunity in Dry AMD / GA: where nomacopan may simultaneously reduce complement drive of GA and risk of CNV through LTB4 inhibitory activity on VEGF

Potential Across Multiple Pulmonary Indications Large Markets, Partnering Opportunities



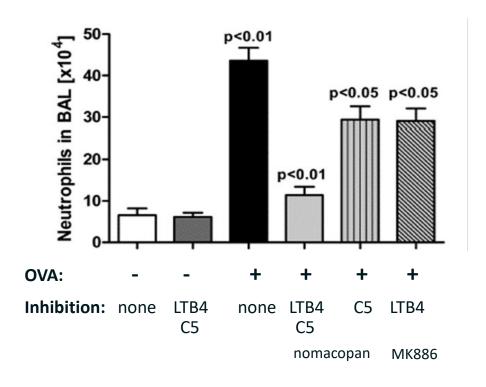


Additive Role Of C5 & LTB4 Established Across Multiple Pulmonary Indications



Lung model of immune-complex alveolitis

Dual inhibition superior to C5 or LTB4 inhibition alone





- Leukotriene pathway validated in the lung.
 Zileuton® approved in severe asthma
- Preclinical lung models show additive effects of C5 and LTB4 inhibition by nomacopan
- Nebulized nomacopan provides median particle size <5µM for deep lung delivery

- Two forms of nomacopan one inhibiting C5+LTB4, the other inhibiting C5 only (pre-saturated with LTB4)
- LTB4 inhibition only is MK886 a leukotriene inhibitor that inhibits 5-lipoxygenase activator protein (FLAP)
- Source: Roversi et al (2013) JBC 288: 18789 18802

Complex Pathology & Progression Of Severe Lung Inflammatory Diseases Reflects Potential For Inhibiting Multiple Pathways



COVID-19 Pneumonia

Severe Asthma

- Potential in a range of lung disorders, characterised by excessive neutrophil activity and exacerbations
- Leukotriene inhibition is an established treatment which can be optimized
- Growing clinical evidence for role of complement in COVID-19 pneumonia and severe asthma
- Opportunity for inhaled administration of nomacopan
- Partnering is likely strategy following proof of principal validation
 - Biomarker & longitudinal study completed.
 LTB4 elevated and potential to identify
 COVID-19 patients suitable for nomacopan
 - FDA approved multi-center investigator-led randomized study adopting a more intense dosing regimen following study in Brazil

- Lack of control in severe asthma recurrent exacerbations requiring either oral steroids, visit to ER, or hospital admission
- Potential clinical study will assess efficacy in moderate-severe asthma refractory to long-acting beta-agonist (LABA) and inhaled corticosteroids (ICS)

Akari Summary



• Therapeutic targets in C5 and LTB4 validated by recent \$1 billion+ acquisitions* of companies targeting complement-mediated diseases

Multiple inflection points in the near term

BP: Phase 3 recruitment expected Q3 2021

TMA-HSCT: Phase 3 pediatric study ongoing

—Ophthalmology: Readout back of the eye residency data expected H2 2021

— Pulmonology: Proof-of-principle activities

R&D: Multiple exploratory programs

• Lead indications expected to be gateways to high potential follow-on indications

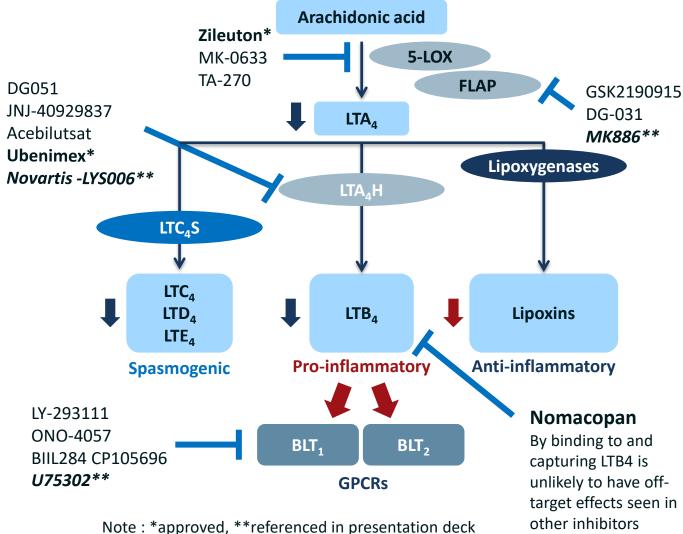
^{*} Acquisitions of RA Pharma by UCB, Achillion by Alexion and Alexion by AstraZeneca



Appendix

LTB4 Ligand Capture: Advantageous & Unique MOA





Off-Target Effects of Other Inhibitors

5-LOX / FLAP inhibitors

Reduces anti-inflammatory lipoxins

BLT1/BLT2 antagonists

 Realization that anti-inflammatory mediators also signal through BLT1/BLT2

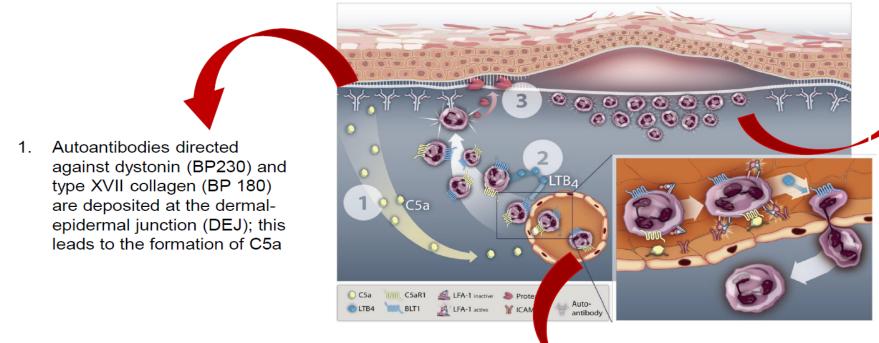
<u>LTA₄H inhibitors</u>

 Secondary anti-inflammatory role for LTA₄H in degrading pro-inflammatory/ remodelling mediator PGP

Note: LTB4 capture by nomacopan is external to cell so will not interfere with recently described anti-inflammatory effects of LTB4 within cells

Interaction Of C5 & LTB4 in Bullous Pemphigoid Pathology





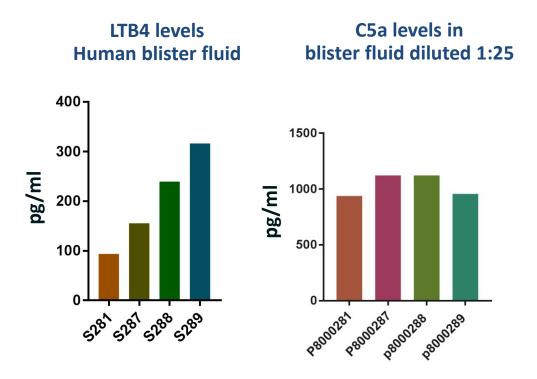
3. Activation of neutrophils at the DEJ by the deposited autoantibodies induces the release of proteases which degrade proteins of the DEJ and compromise dermal-epidermal adhesion.

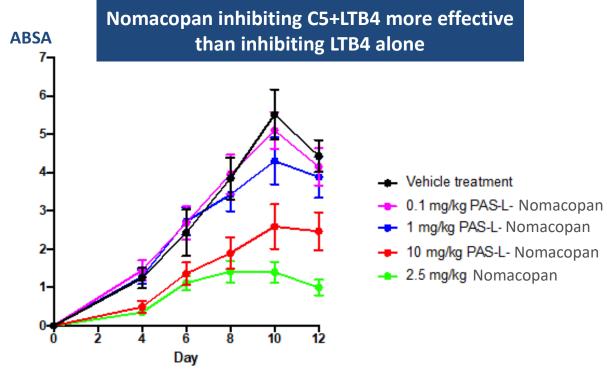
2. C5a binds with C5aR1 on neutrophils in dermal blood vessels and induces the release of LTB4. LTB4 further amplifies the recruitment of neutrophils and directs their migration to the DEJ.

Rational for Nomacopan in Bullous Pemphigoid Preclinical Efficacy & Elevated C5a/LTB4 (In BP Patients)



Elevated levels of LTB4 and C5a indicate activation of complement and synthesis of LTB4 in blisters





- Mouse model of BP-like epidermolysis bullosa acquisita (EBA)
- ~80% reduction in absolute body surface area affected by blisters (ABSA) on Nomacopan (SQ) compared to vehicle
- Long acting LTB4-only Nomacopan (10 mg/kg) ameliorates blister formation, but less effective than molar equivalent dose of Nomacopan (2.5 mg/kg) inhibiting C5 + LTB4

Preclinical passive mouse model of epidermolysis bullosa acquisita (EBA)

Role Of LTB4 In Neovascularization Of AMD



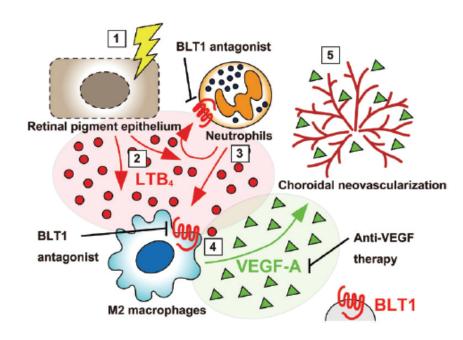


Fig. 2. M2 macrophages (M2 Mφ) promote neovascular age-related macular degeneration (AMD) via the LTB₄–BLT1 axis (1). Retinal pigment epithelium damaged by lipid oxidation products such as malondialdehyde (2) releases leukotrienes such as LTB₄, resulting in (3) the recruitment of immune cells including neutrophils and inflammatory monocytes/Mφ to the injured retina and leading to autocrine/ paracrine loop of LTB₄ production in these cells (4). M2 Mφ are also recruited and secrete VEGF-A, followed by (5) acceleration of choroidal neovascularization (CNV).

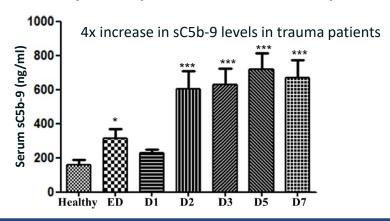
- LTB4 are released by damaged RPE in AMD
- LTB4 recruits immune cells including macrophages
- Recruited macrophages produce VEGF
- VEGF leads to CNV to form wet AMD
- Anti-VEGF is the standard of care for wetAMD.
 It works mainly by reducing choroidal neovascularization,
 (CNV) leakage / edema
- Anti-LTB4 can prevent CNV or stop further leakage

Sasaki & Yokomizo: The leukotriene receptors as therapeutic targets of inflammatory diseases. *International Immunology 2019, 31(9):607-615*

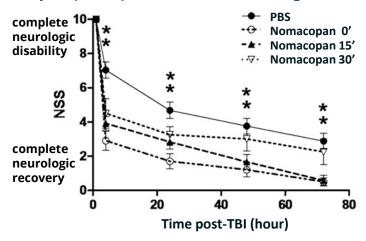
Cooperative Research & Development Agreement (CRADA) With US Army In Trauma



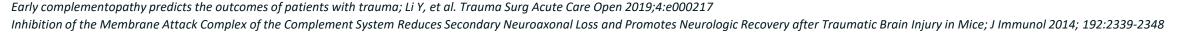
USAISR study of complement level in trauma patients



Nomacopan (OmCI) reduces neural damage in mouse trauma model



- Ongoing collaboration with U.S. Army Institute of Surgical Research (USAISR) to evaluate nomacopan activity in pig model of blast injury and haemorrhagic shock
- Nomacopan reduced secondary neuroaxonal loss and promoted neurologic recovery after traumatic brain injury (in mice)
- Nomacopan does not require special handling and can be carried at ambient temperature; may facilitate use in prehospital settings
- C5 and LTB4 inhibition by nomacopan for treatment of trauma is supported by a large body of literature reflecting the harmful role for both these inflammatory mediators in early pathophysiology of trauma & haemorrhagic shock



Active Pipeline Program Expansion



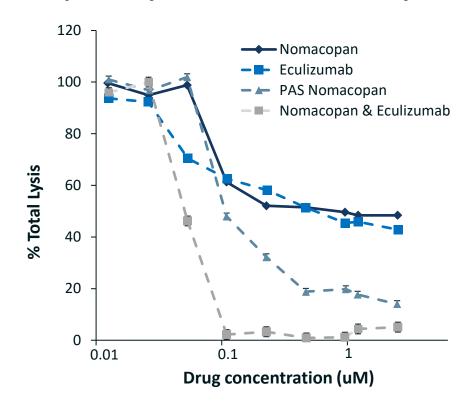
Engineered Nomacopan

- Long-acting PASylated nomacopan with potential for weekly SQ / IVT dosing
- Tissue targeted: nomacopan linked to peptides which bind to specific disease related tissue such as neuromuscular junction
- Ligand specific: C5 or LTB4 inhibition only for diseases that do not require inhibition of both mediators

Other lipocalin molecules

 Votucalis captures histamine uniquely preventing activation of all four histamine receptors which can induce diverse pathophysiological processes, including chronic pain, itch and inflammation. Potential for topical delivery.

Inhibition of complement alternative pathway rabbit red blood cell lysis





Combined Inhibition Of Complement & Leukotriene Pathways To Treat Inflammatory Diseases

