

# **Proprietary Renalase Platform**

**A first-in class Renalase agonist for  
Hyper-inflammation in:**

**Systemic Viral Infections**

**COVID-19**

**Acute Organ Injury**

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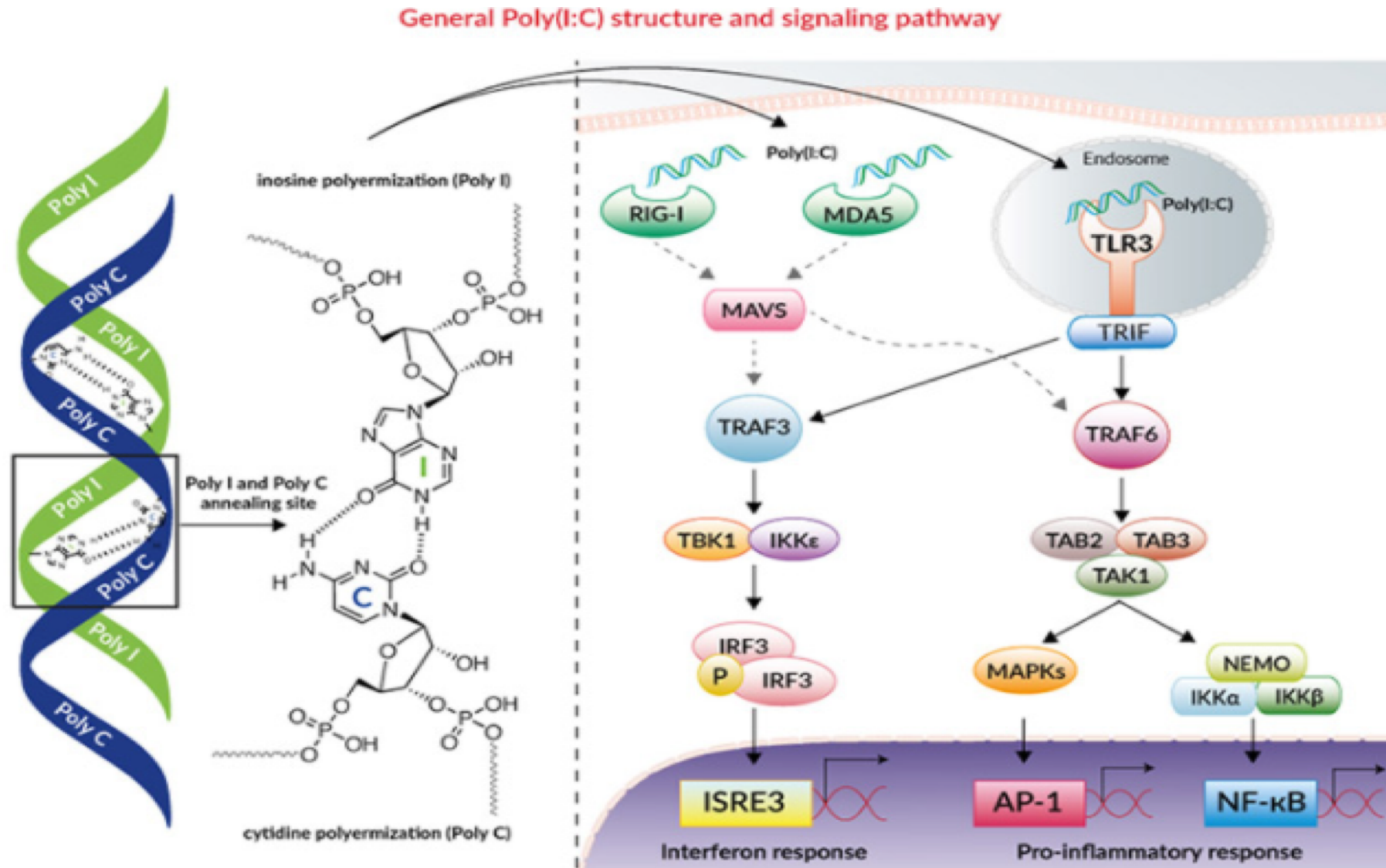
**Scientific Advisory Board member, Bessor Pharma**

**Co-founder and Chair of Scientific Advisory Board, Personal Therapeutics**

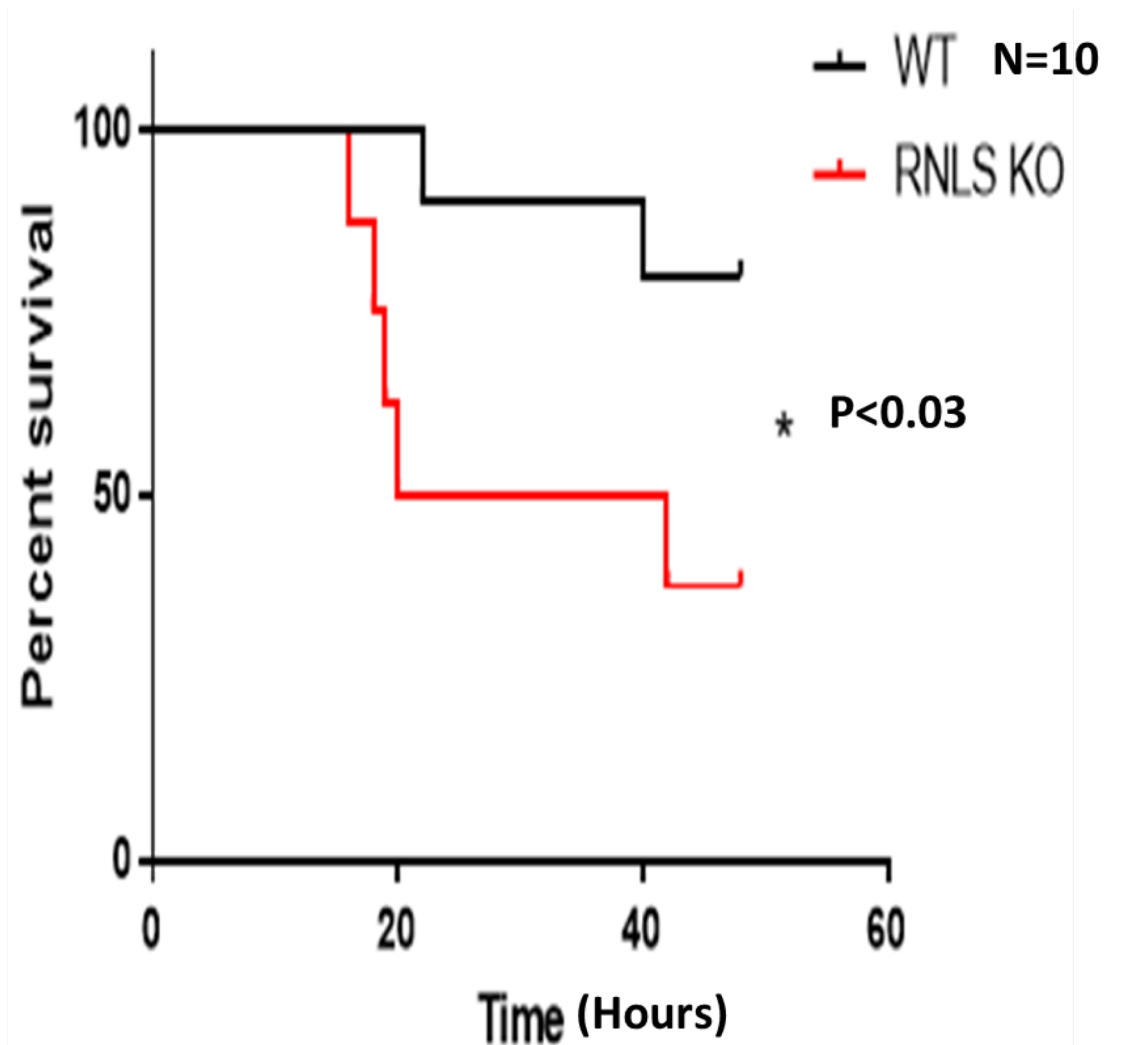
# The Renalase Agonist Platform

- Renalase (RNLS): a secreted protein that promotes cell survival and decreases inflammation through defined mechanisms
- Platform opportunities for broad indications
  - Hyper-inflammation in systemic viral infections, including COVID-19
  - Acute organ injury: Lung, Kidney, and Pancreas
- Proprietary RNLS mimetic peptide (BP-1002) with demonstrated preclinical proof of efficacy in acute diseases
  - IND targeted for Q1 2022
- Potential biomarker-linked therapeutic strategy with proprietary RNLS assay to optimize patient selection
- 3 NIH SBIR grants (>\$2.5 million)

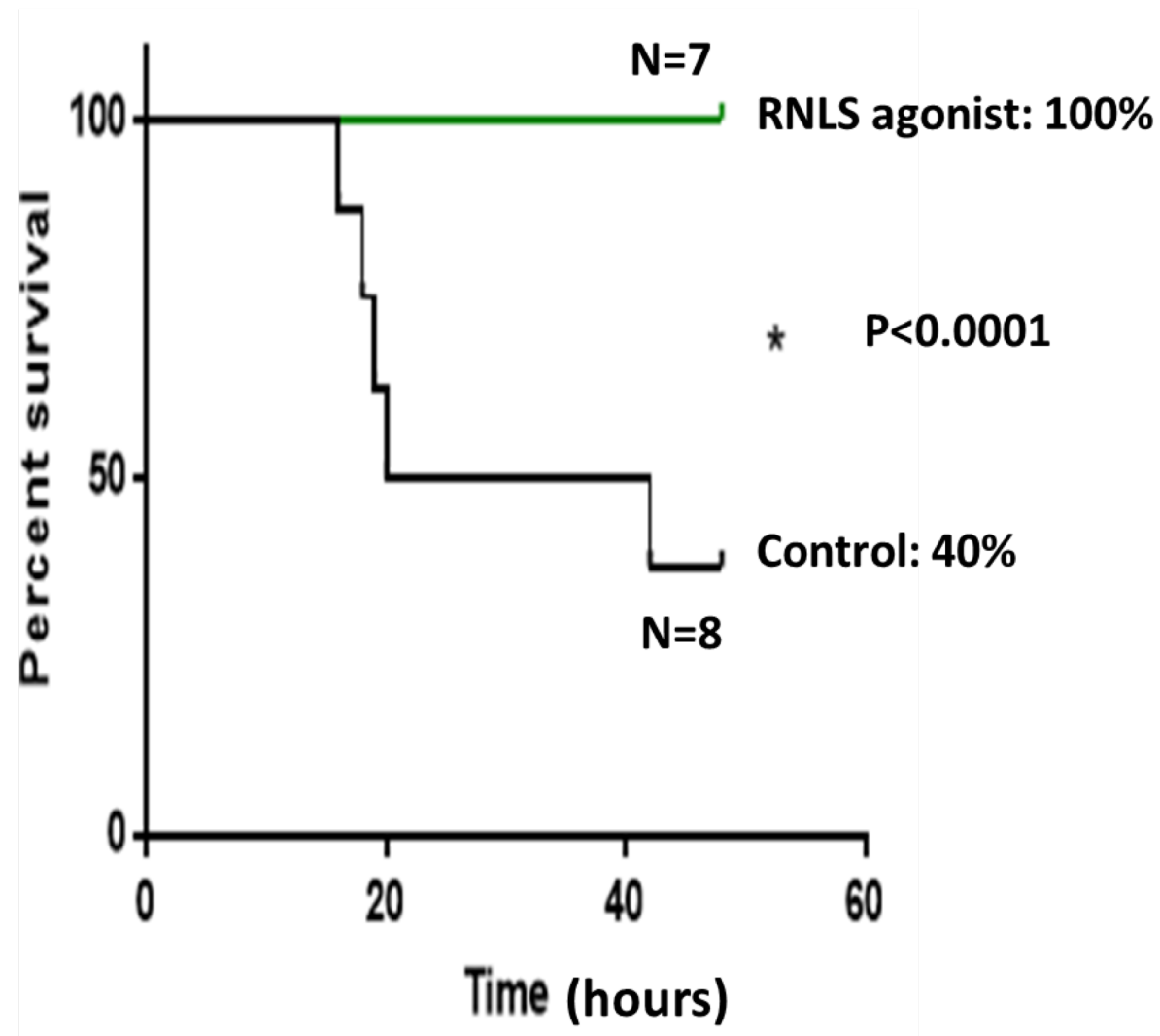
# Poly (I:C): A General Model of Hyper-inflammation



# Renalase agonist BP-1002 improves survival in Poly (I:C) viral mimic model



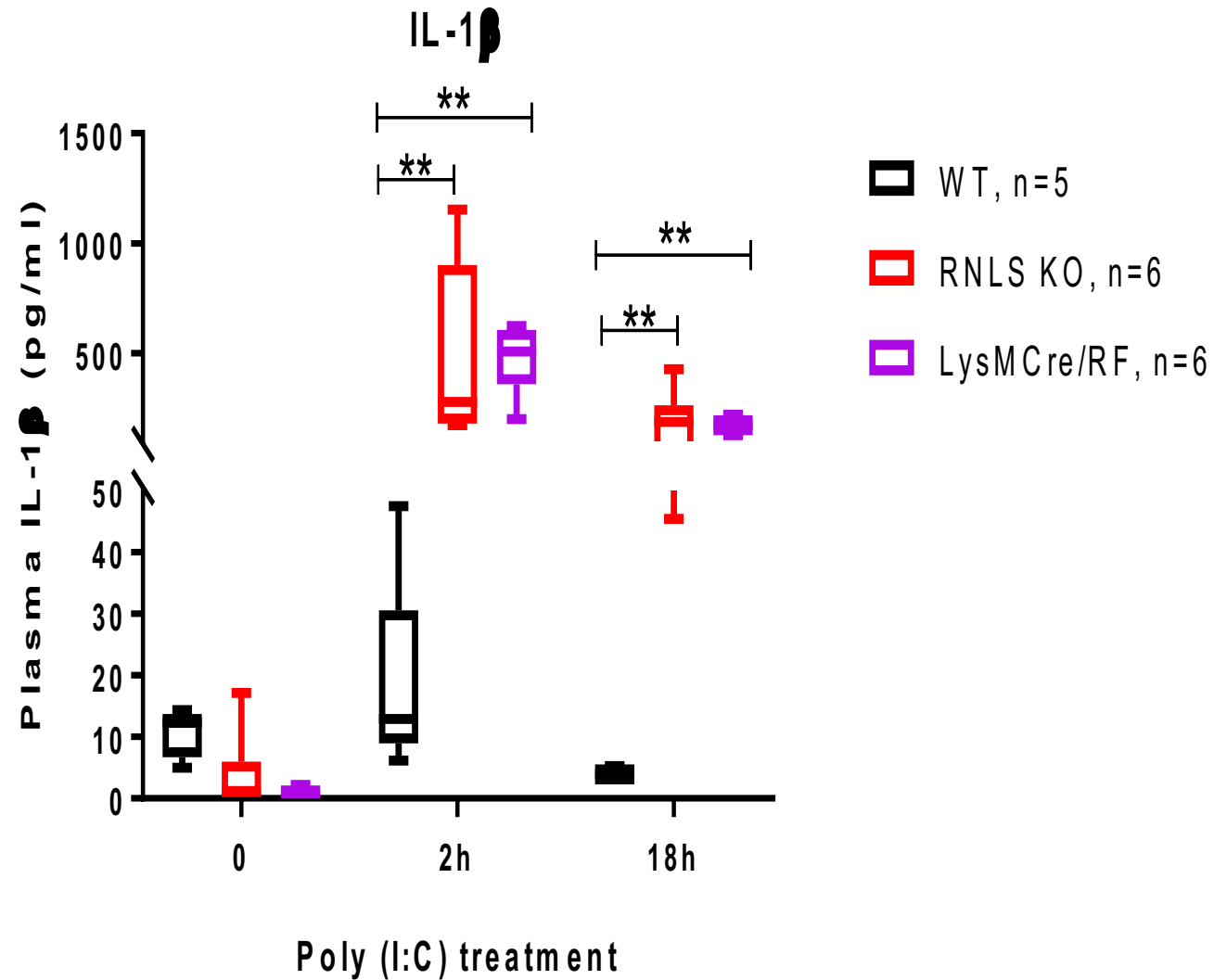
Increased mortality in RNLS KO  
Exposed to Poly (I:C)



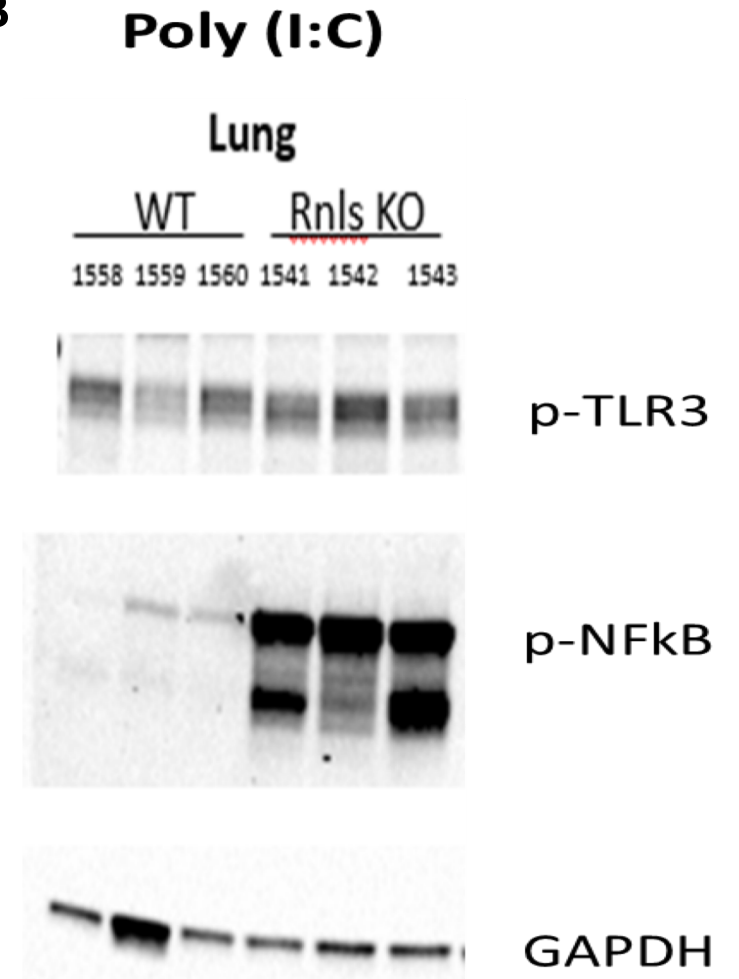
BP-1002 rescues RNLS KO phenotype

# RNLS deficiency dramatically increases Poly (I:C) mediated inflammatory cytokines production through NF- $\kappa$ B, ISRE3 activation in mouse model

A



B



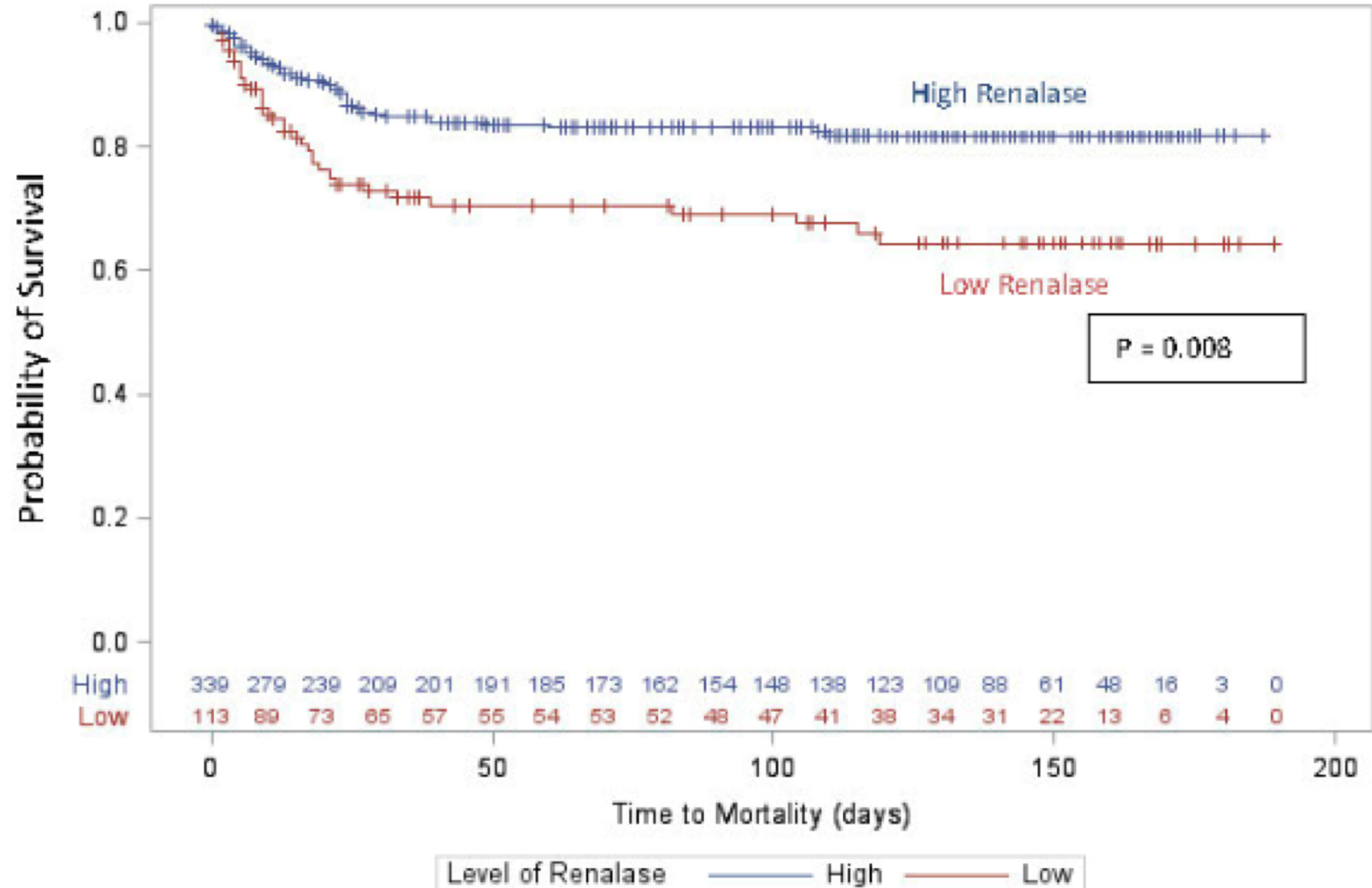
# Renalase Levels Correspond with Mortality in COVID-19 patients

Renalase levels correspond with mortality in COVID-19

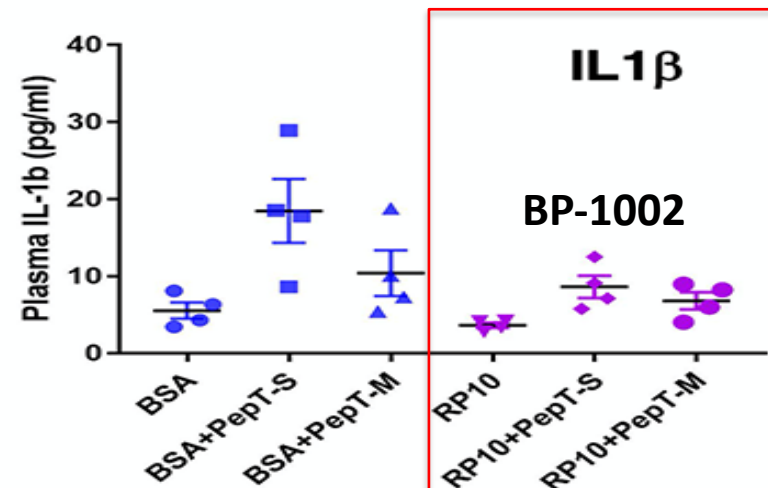
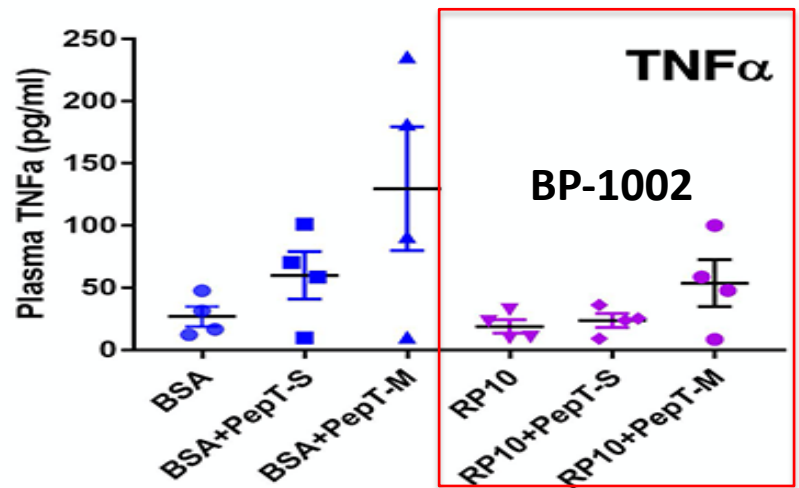
Low plasma levels are associated with worse outcomes in COVID-19. 2020. Wang, et al MedRxiv (Initial cohort of 51 COVID-19 Subjects)

Updated cohort: N=458 COVID-19 Subjects

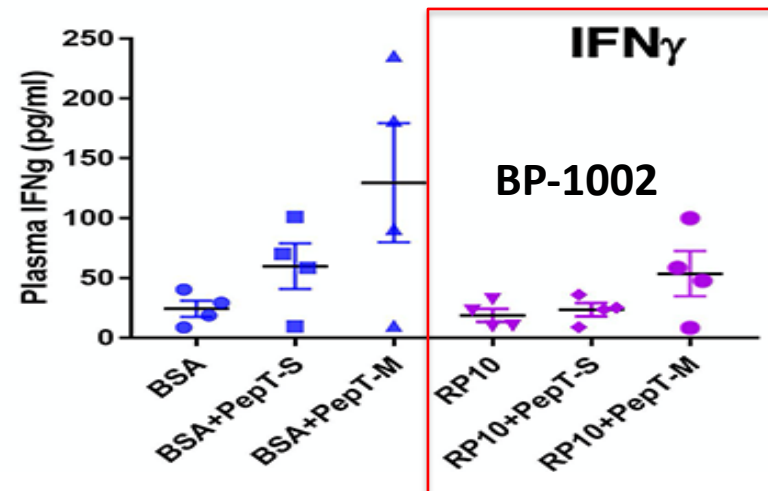
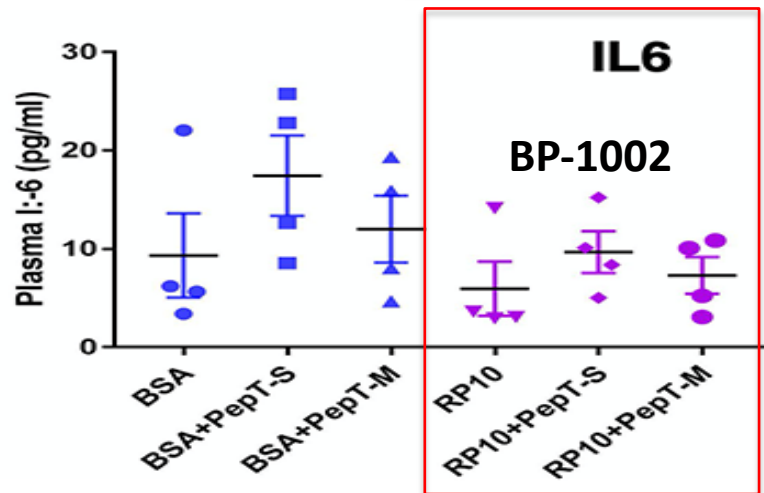
Paper under review



# BP-1002 blunts multiple COVID-19 induced inflammatory cytokines in human blood ex vivo

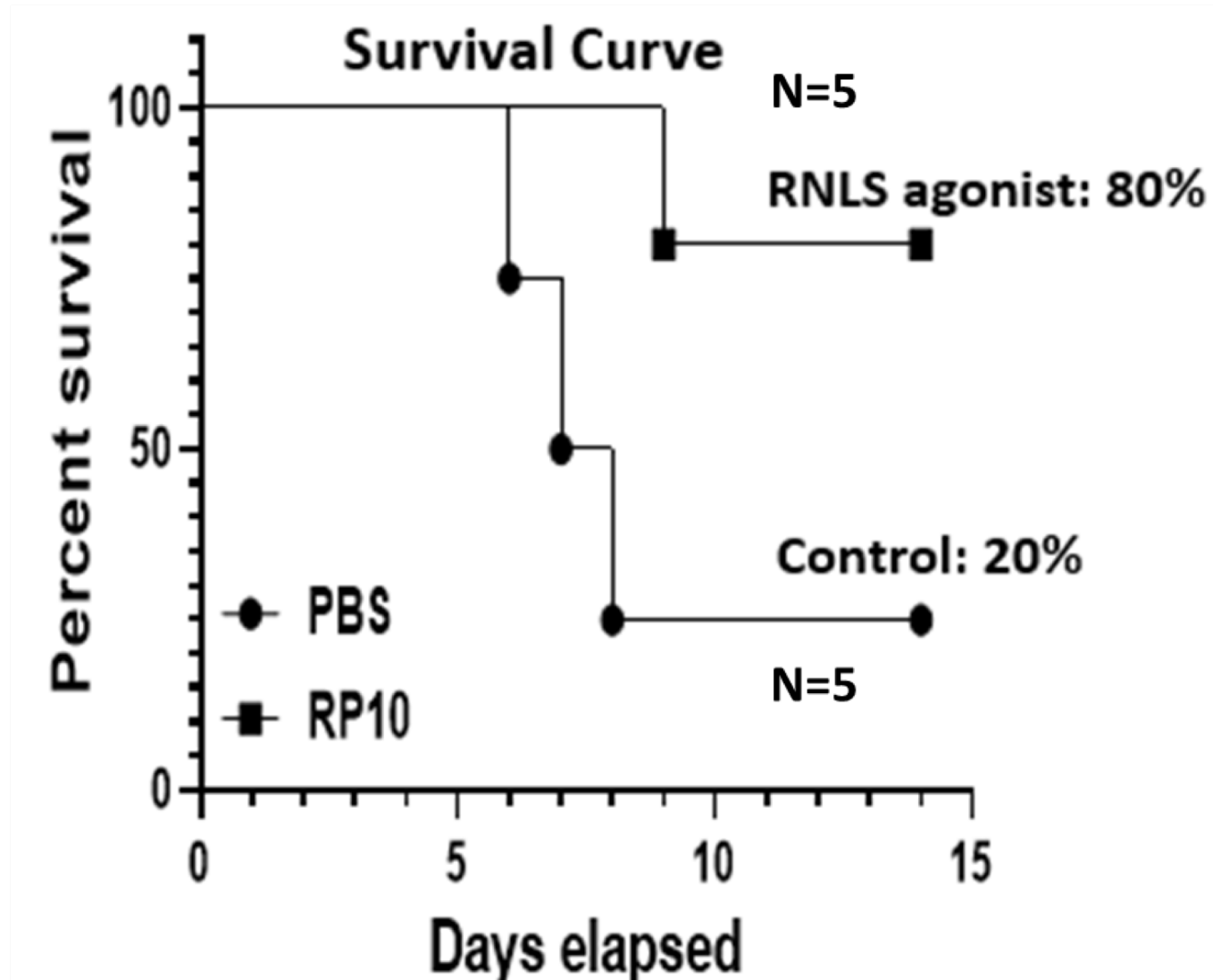


COVID-19 mixed peptides contained in capsid proteins S and M [0.19 nM] were added to fresh human blood from 4 healthy donors for 3 hrs and cytokine responses were assayed by ELISA. Little to no response was seen with COVID-19 peptide n (not shown)



- BSA
- BSA+PepT-S
- ▲ BSA+PepT-M
- ▼ RP10
- ◆ RP10+PepT-S
- RP10+PepT-M

# RNLS agonist BP-1002 (RP10) improves survival in COVID-19 mouse model

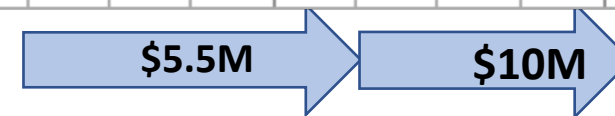
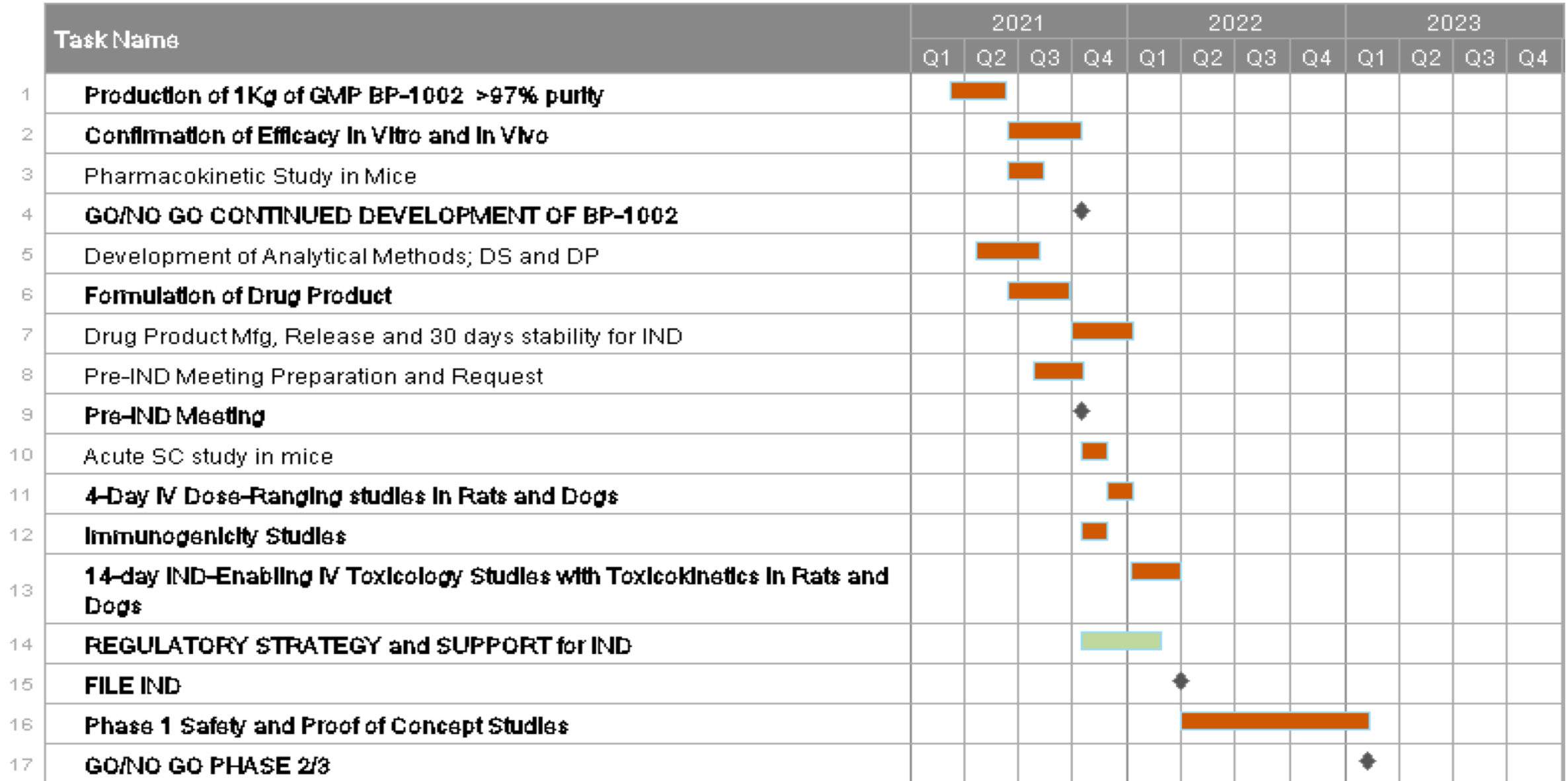




# BP-1002 vs Standard Therapy in COVID-19

- Advantageous Side Effect Profile Over Dexamethasone
  - BP-1002 does not suppress adrenals and thymus; Dexamethasone does
  - Dexamethasone increases risk of opportunistic infections
- Potential therapeutic advantage over Tocilizumab,
  - BP-1002 targets multiple cytokines and is also a survival factor that prevents cell death
  - Tocilizumab only targets IL-6 Receptor
- Potential for predictive RNLS Assay to optimize patient selection and timing of administration of BP-1002

# Development plan to clinical trials: IND in Q1 2022



# BP-1002 in Hyper-Inflammation

- Broad utility in systemic viral infections and acute organ injury
- Low Renalase associated with worse outcome in COVID-19 patients
  - 1<sup>st</sup> indication: COVID-19
- Chemically synthesized novel small RNLS mimetic peptide, designed for improved stability and efficacy
  - Treats severe disease and reduces mortality in animal models
  - Scalable for chemical manufacture
  - Composition of matter patent filed
  - Licensed and developed in collaboration with Bessor Pharma
  - IND in Q1 2022
- Platform potential for biomarker-linked therapeutics for acute diseases.

New drug  
development  
and value  
creation

*Uniquely translating university assets to  
innovative products*

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