Qprotyn
Simple. Safe. SubQ.

www.qprotyn.com

# Qprotyn's Viscosity-Reduction Platform for Monoclonal Antibodies

## HILOPRO® Technology

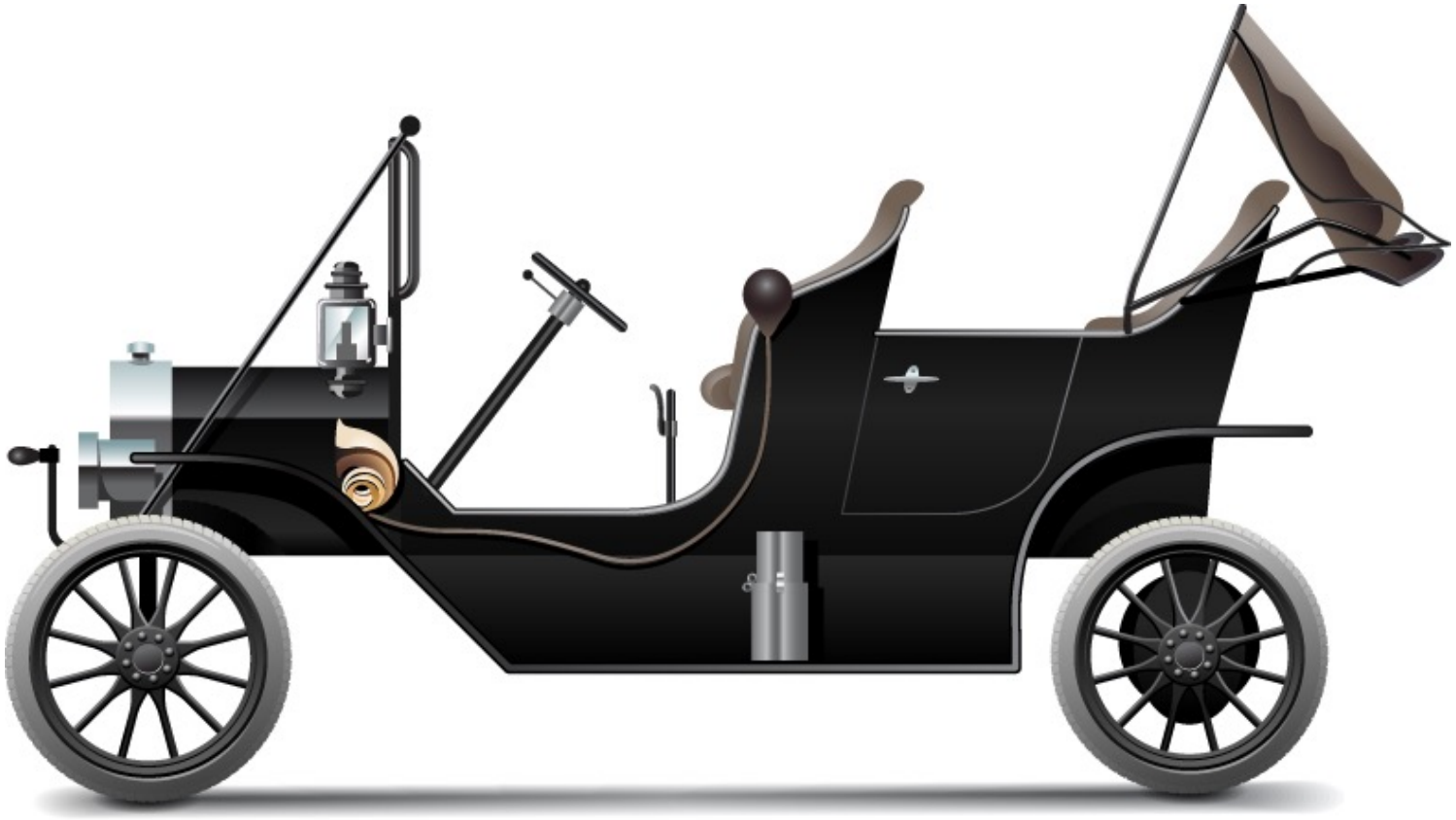
Formulating mAbs for High Concentration – Low Viscosity, SubQ Delivery

# Advanced mAbs ...

Inebilizumab
Cemiplimab-rwlc
Avelumab
Sacituzumab govitecan-hziy
Naxitamab-gqgk
Elotuzumab
Margetuximab-cmkb
Reslizumab
Nivolumab
Isatuximab-irfc
Siltuximab
Teprotumumab-trbw
Ramucirumab
Ipilimumab
Alemtuzumab
Panitumumab
Cetuximab
Palivizumab ...

and many more.

# ... same old delivery bottlenecks



Basically, even in the year 2022, mAbs can be administered any way you wish,

as long as it is IV*

Qprotyn Simple. Safe. SubQ. | HILOPRO® Technology

* with some important exceptions

# Physics and Chemistry ...

# ... have constrained biologics' delivery

## The Constraint ?

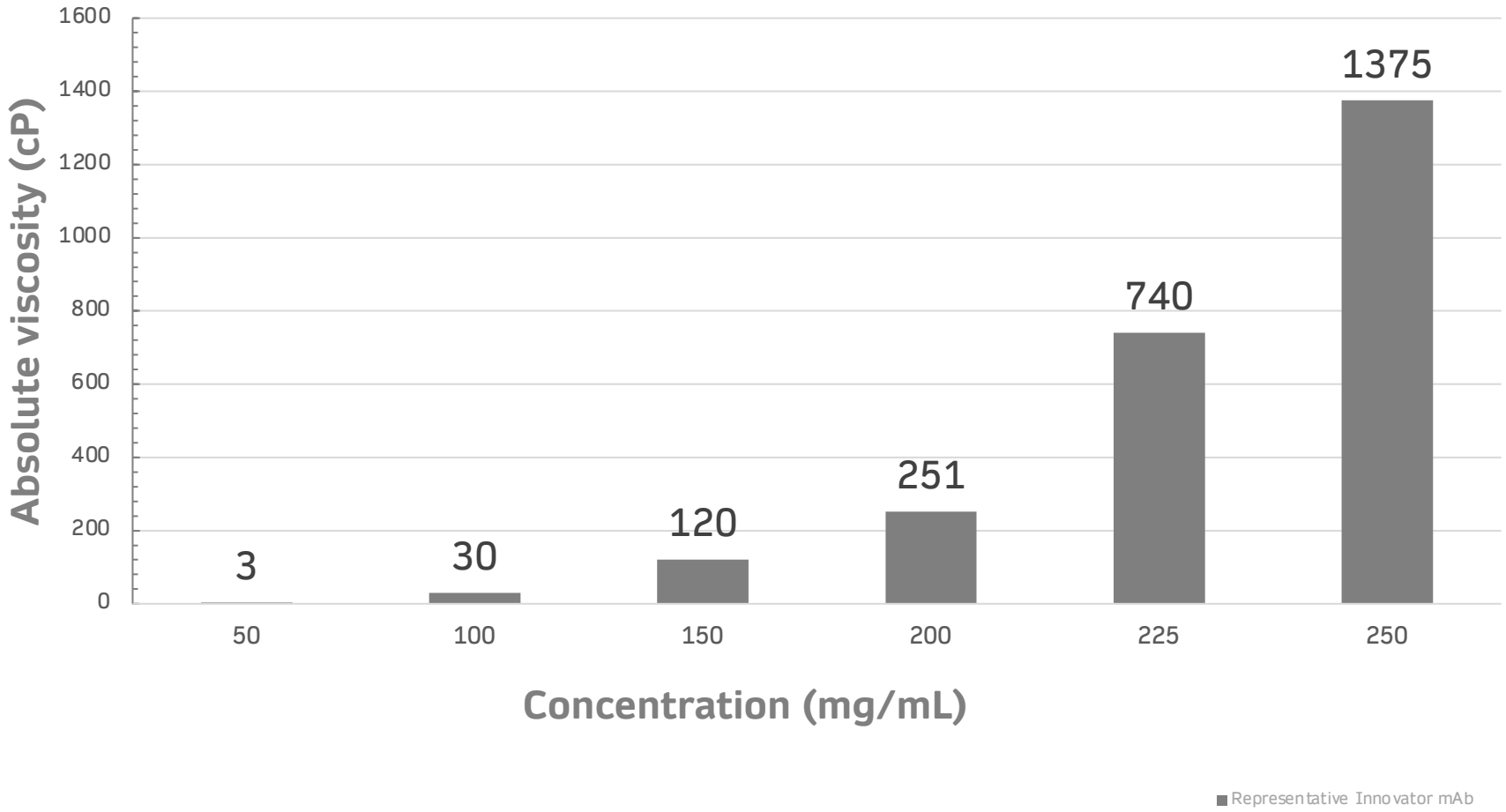
High Dose

+

High Concentration

=

**High Viscosity**




Viscosity increases strikingly with higher concentration.

Qprotyn Simple. Safe. SubQ. | HILOPRO® Technology

## With Qprotyn...

## ... Innovation opens new possibilities

Qprotyn represents BRL and is the distributor of BRL's viscosity-reduction technology.

In May 2020, Bhami's Research Laboratory (BRL) was granted a US patent for an elegant new technology that has rewritten this equation:

High Dose

+

High Concentration

+

**HILOPRO® Technology**

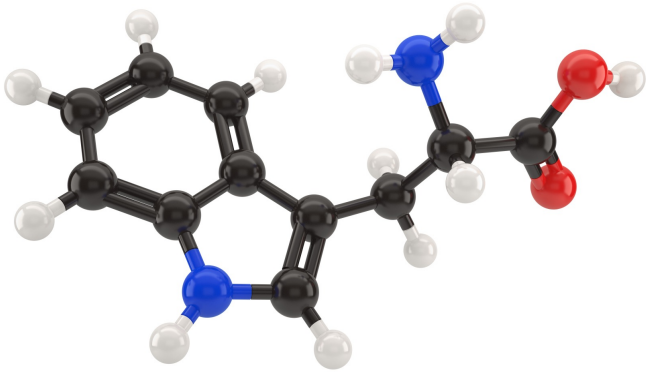
=

**Low Viscosity**

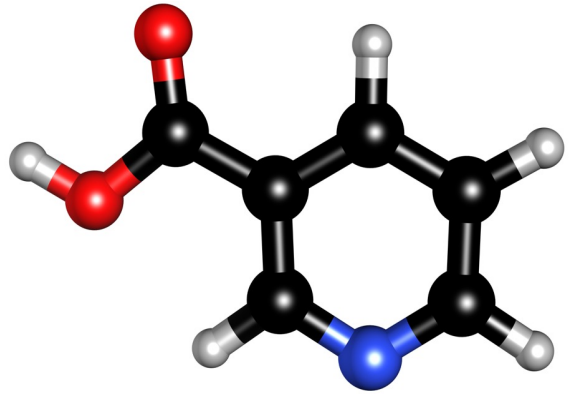
# Safety Data

## Safety of Excipients

Niacin and Tryptophan used **in combination** in the HILOPRO® Technology, have a No-observed-adverse-effect level (NOAEL) of **26mg/kg** of body weight for Niacin and **15.5mg/kg** of body weight for Tryptophan.



**Tryptophan**



**Niacin**

These are **GRAS excipients** that have been used **independently** in commercial parenteral nutritional supplements at high doses.

- Based on a 28-day, repeated dose toxicity study of the excipients conducted at an independent CRO*
- Additional data and the copy of the complete study can be provided under a CDA

# We're not just saying that...

## ... We can prove it

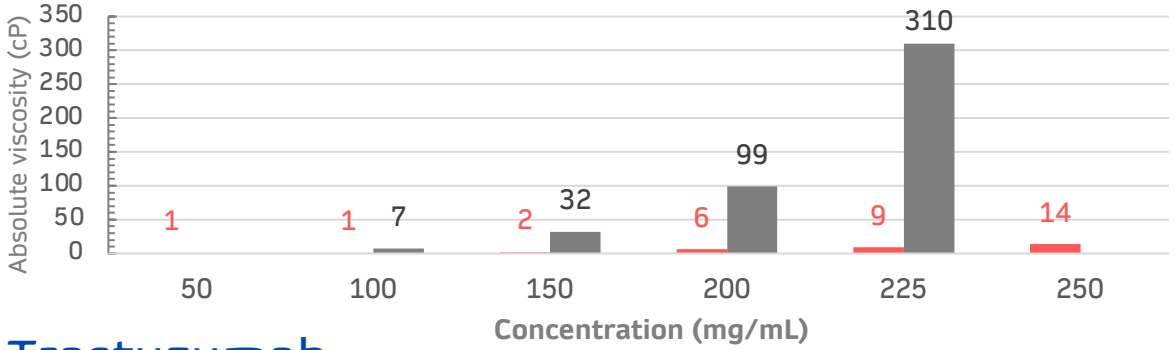
Niacin and Tryptophan have never been used in the in combination for viscosity-reduction purposes.

Together, they show a dramatic reduction in viscosity across all tested mAbs at roughly half of NOAEL values.

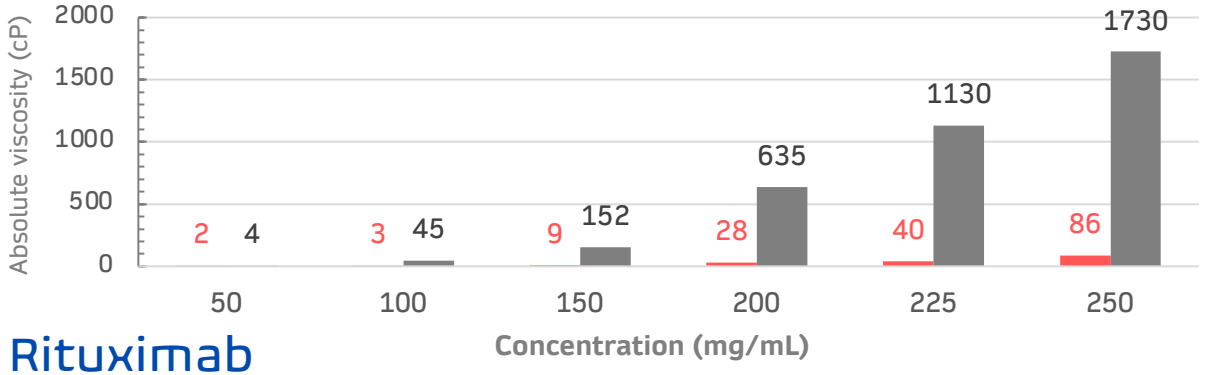
| Buffer | Formulation Composition | Protein concentration (mg/ml) | Viscosity (cP at 25° C) |
|---|---|---|---|
| 25 mM PHOSPHATE BUFFER, pH = 6.0 | **HILOPRO® EXCIPIENTS** Niacin + Tryptophan | **250** | **18** |
| | | **264** | **20** |
| 25 mM HISTIDINE BUFFER, pH =6.0 | 200 mM NaCl and 250 mM Arginine | 250 | 48 |
| | 200 mM NaCl | 257 | 59 |
| | 250 mM Arginine | 264 | 61 |
| | 1737 mM Proline | 240 | 46 |
| | 250 mM Thiamine | 250 | 48 |
| | 150 mM Nicotinamide | 250 | 51 |
| | 690 mM Nicotinic Acid Sodium Salt | 226 | 41 |
| | 250 mM Camphor Sulphonic Acid | 229 | 32 |
| | 51 mM Caffeine | 250 | 42 |
| 25 mM PHOSPHATE BUFFER, pH=6.0 | **Control:** 25 mM Phosphate Buffer Only | 250 | 170 |
| | | 264 | 253 |

Qprotyn Simple. Safe. SubQ. | HILOPRO® Technology

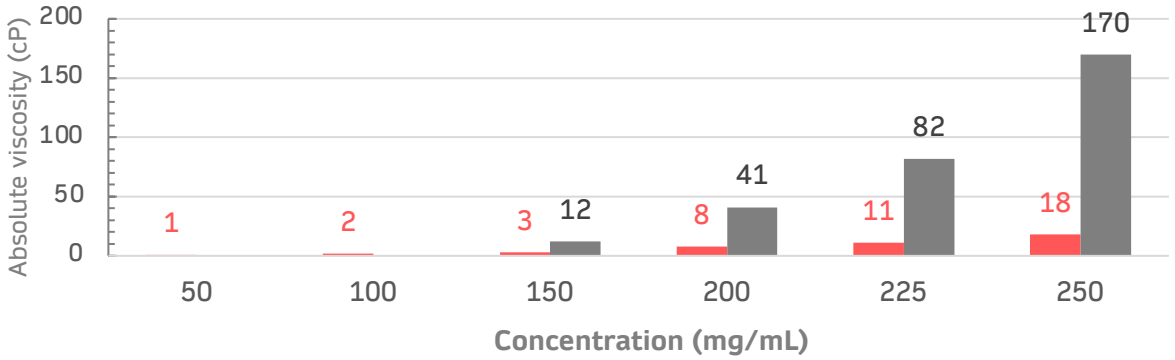
## Bevacizumab



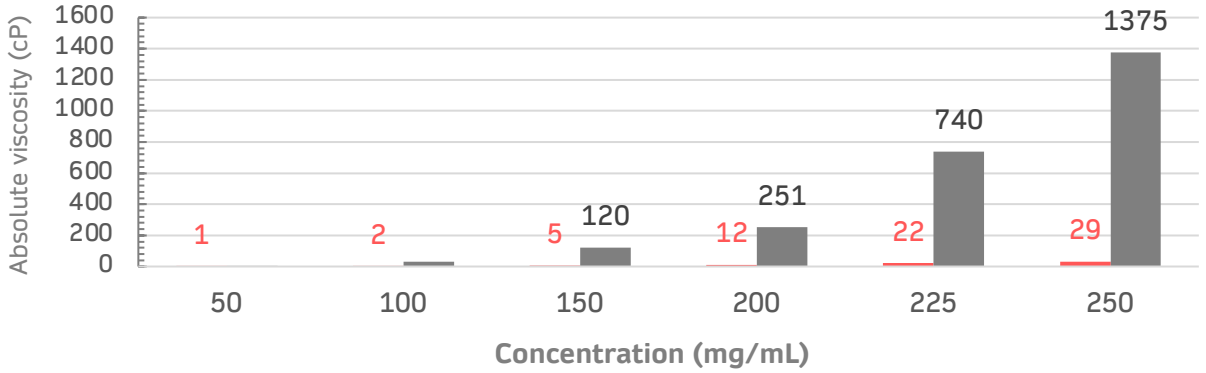

## Cetuximab



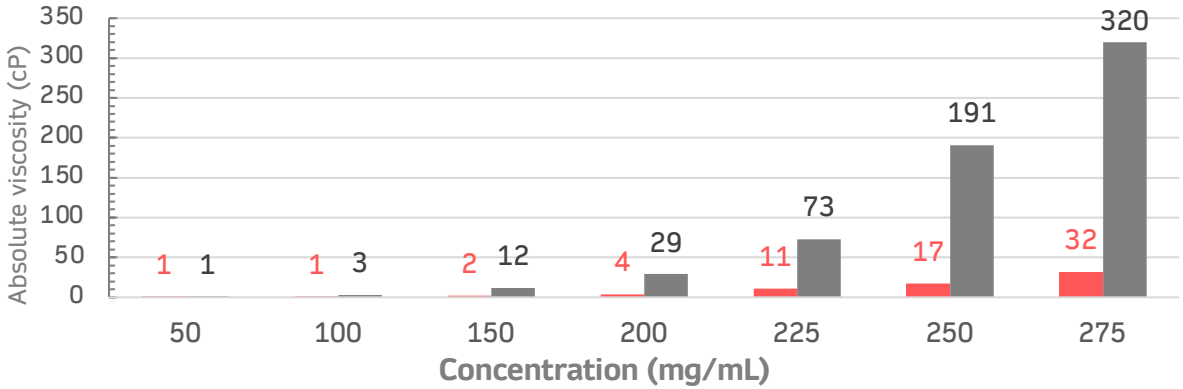

## Trastuzumab



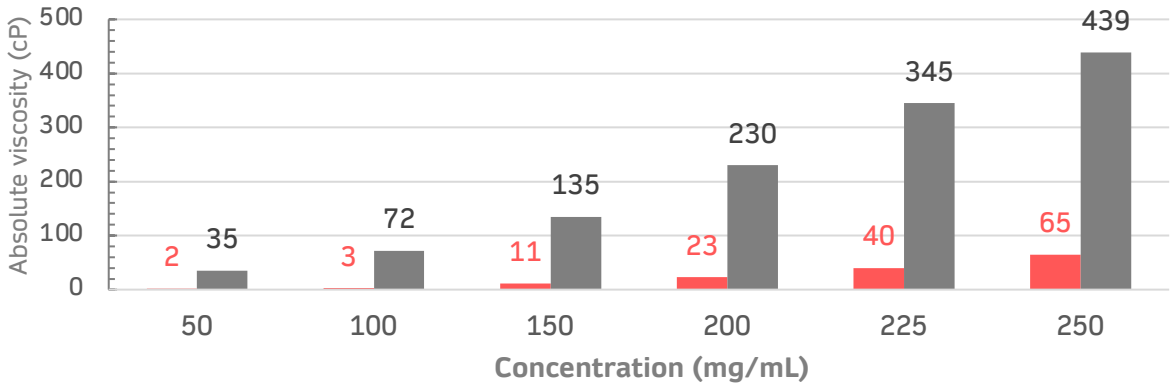

## Rituximab




## Human Gamma Globulin




## Etanercept




Qprotyn Simple. Safe. SubQ. | HILOPRO® Technology

With HILOPRO®

Without viscosity-reduction excipients

# It is among the best...

## ... stable, viscosity-reduction platform out there today

In terms of potential, HILOPRO® surpasses **all contemporary technologies** with respect to:

- Universal formulation technology for any mAb
- Platform Application
- Viscosity Reduction
- Cost
- Safety and Stability
- Turnaround time
- Ease of Manufacturing

| SubQ Technology | Key Features | Major Disadvantages |
|---|---|---|
| High volume delivery using hyaluronidase | Degrades hyaluronan in the subcutaneous space to allow for high volume delivery | • Long administration time<br>• High volume drug delivery<br>• High cost of manufacturing<br>• Risky self-administration for patients |
| Viscosity reducing excipients and formulation technologies | Use buffering agents and formulation excipients to reduce protein aggregation | • Not suitable as platform technologies<br>• Potential safety and toxicity concerns<br>• Inferior viscosity reduction abilities compared to HILOPRO® |
| Fluid suspension and crystallization | Use specialized particle engineering, crystallization, atomization or dehydration techniques | • Particles are in suspension formulations, not solutions<br>• Not tested successfully for significant number of mAbs<br>• High cost of manufacturing and scaling-up |
| High viscosity injection devices | Use high force and resistant containers to deliver high viscosity formulations | • Inherent stability challenges<br>• Not tested successfully for significant number of mAbs<br>• Increased injection site pain |

# The HILOPRO® Formula...

## ... High Concentration + Low Viscosity = Low Volume

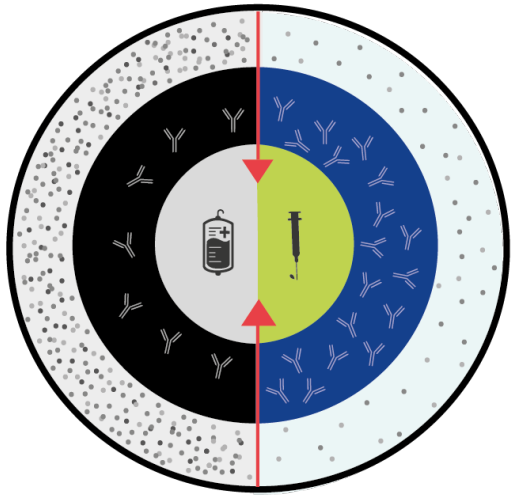
A **single formulation** technology that supports multiple dosing and delivery options

=

**Greater Flexibility**

+

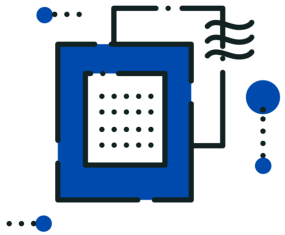
Optimal patient convenience



High-concentration, low-viscosity, low-volume dosing opens new delivery possibilities
(while retaining existing delivery capabilities).

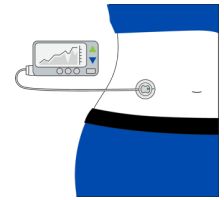
Intravenous

SubQ



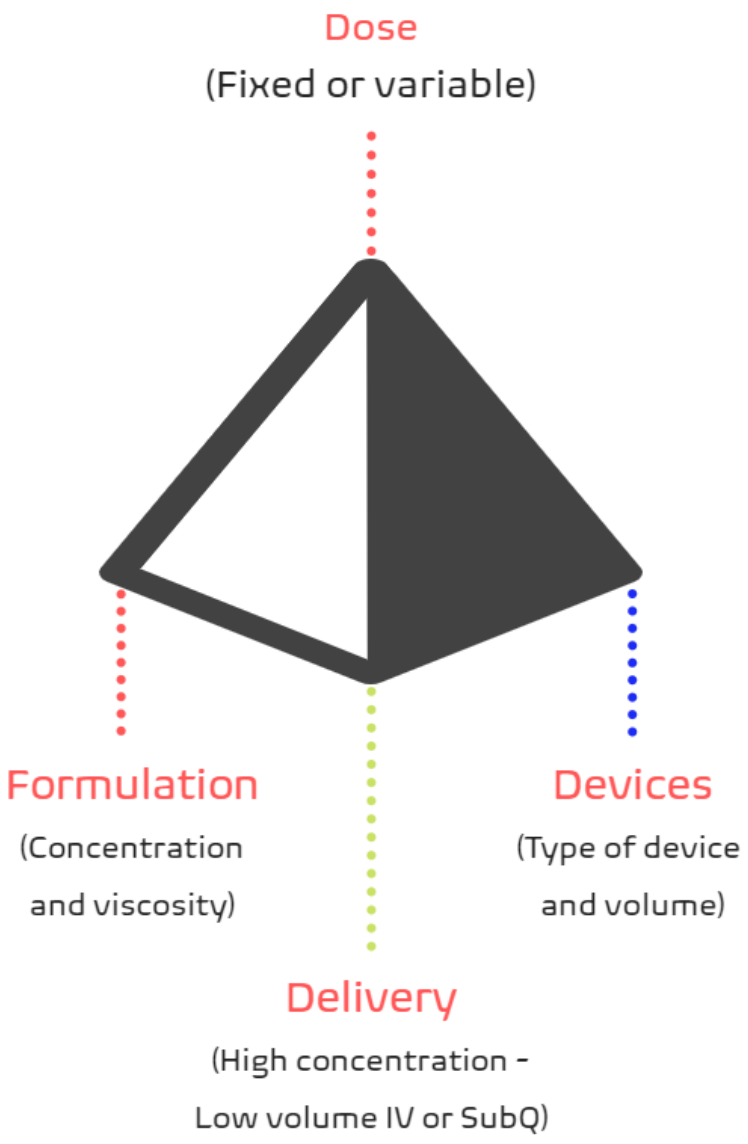
Microneedle Patches

Ocular / Intravitreal



Wearable Device

Qprotyn Simple. Safe. SubQ. | HILOPRO® Technology




# IV to SubQ is a System Approach

| Example | Current System | HILOPRO® System |
|---|---|---|
| mAb Dose | 500mg | 500mg |
| Concentration | 10mg/mL | 250 mg/mL |
| Form | Lyophilized powder for reconstitution | Solution |
| Delivery | IV | SubQ |
| Device (Vol.) | Infusion Bag (100mL) | 2cc — Syringe, Autoinjector, Wearable Device |
| Viscosity | NA | < 20 cP |
| Time to administer | 30 - 90 min | < 1 min |

# Advantage ...

- ✓ Safety
- ✓ Temperature stability
- ✓ Shelf life
- ✓ Efficacy
- ✓ Bioavailability
- ✓ Patient Convenience

## ... HILOPRO®

GRAS — Excipients approved by the US-FDA and used in commercially available parenteral supplements

High concentration, low viscosity
>200mg/mL at 18cP

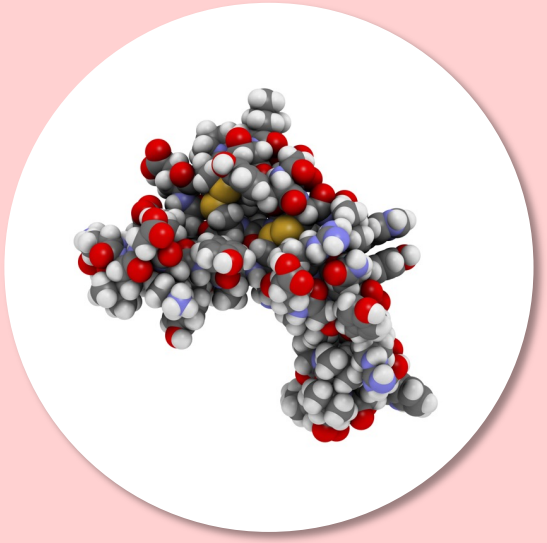
Confirmed stability at $4^{0}C$ and $25^{0}C$ under test conditions

Potential for Longer Lasting efficacy as compared to IV delivery

Administration time reduced from hours to minutes

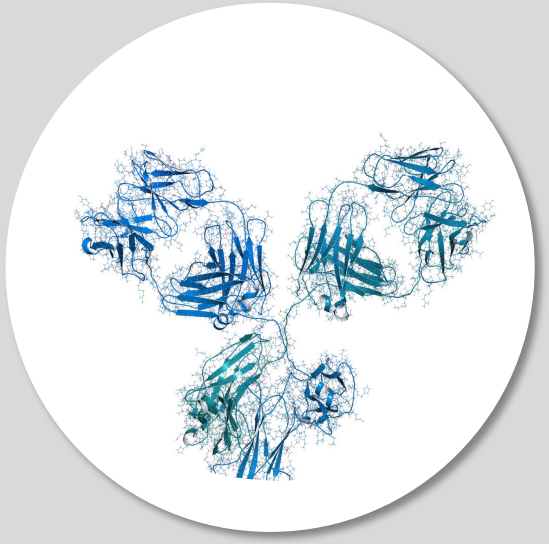
Qprotyn Simple. Safe. SubQ. | HILOPRO® Technology

# Qprotyn Value Proposition



## Innovator mAbs

Dosage of >500mg can be now delivered direct to SubQ instead of IV.



## mAbs in Trials

mAbs in trial can be upgraded from IV to SubQ administration.

## Bio - betters

First-mover advantage and differentiation value for SubQ biosimilars over dominant innovators.

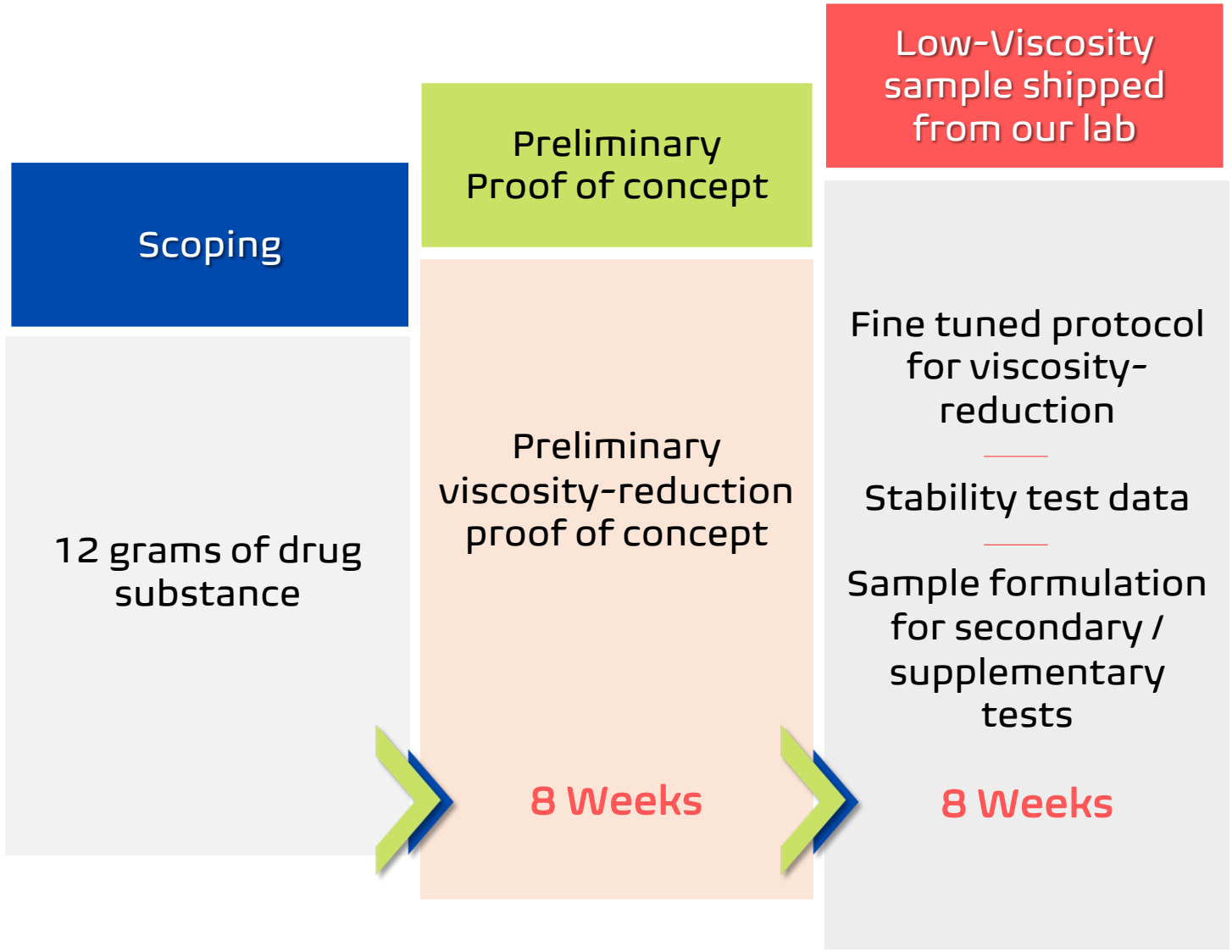
# Prove it !

## High dose mAbs and Biosimilars' pipeline

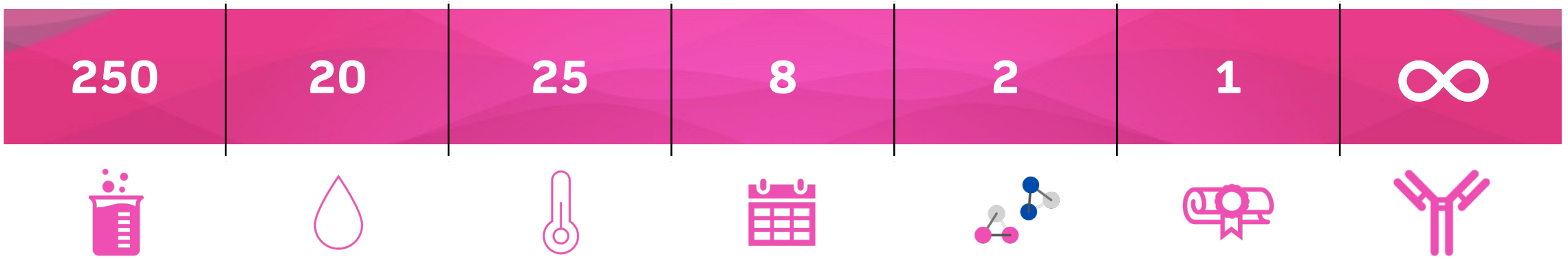
We would love to !!

Proof of Concept in
**8 weeks.**

HILOPRO® formulated sample shipped from our labs in to yours, in
**16 weeks**




Qprotyn Simple. Safe. SubQ. | HILOPRO® Technology




# Changing the world one mAb at a time.

Qprotyn
Simple. Safe. SubQ.
www.Qprotyn.com

Email: info@qprotyn.com
Website: www.qprotyn.com

1-844-QPROTYN
1-844-777-6896

125 Cambridge Park Drive, Suite 301
Cambridge, MA 02140 (USA)