NB-016: First-in-class small-molecule MyD88 inhibitor

Novel mechanism targeting innate immune signaling at its molecular origin. A New Chemical Entity and the world's first small-molecule MyD88 inhibitor; set to enter clinical-stage compassionate use. Breakthrough results across multiple dermatological indications.
No competitor has reached clinical use with a small-molecule MyD88 inhibitor.

NB-016: First-in-class small-molecule MyD88 inhibitor

Novel mechanism targeting innate immune signaling at its molecular origin

MyD88 is the master switch of innate immunity, the single adaptor protein through which 13 of 14 Toll-Like Receptor sub-families signal. Blocking it addresses the root cause of the world's most prevalent chronic diseases. No approved drug does this. NB-016 is the first.

The Problem

- Non-infectious inflammatory diseases are the #1 cause of chronic morbidity globally
- No existing therapy, biologic or small-molecule, is curative
- Biologics target single cytokines; steroids suppress broadly; neither addresses the signaling origin
- The TLR/MyD88 pathway drives autoimmune, oncological, neurological, metabolic and ischemic disease

The Solution

- NB-016 blocks MyD88 dimerization, interrupting the cascade at its molecular origin
- 1.1 New Chemical Entity; AI-assisted drug design; 19 patents granted (US, EU, China)
- World's first MyD88 inhibitor in clinical-stage compassionate use
- 100% complete remission across all IIT dermatology cases
- >90% radical cure rate; 4+ year relapse-free follow-up confirmed
- Dual IND approval: China NMPA + US FDA; Phase II underway

100%

Remission Rate

IIT Dermatology

19

Patents Granted

US · EU · China

2x

Dual IND Approval

NMPA + FDA

NB-016: First-in-class small-molecule MyD88 inhibitor

Why Invest Now

De-risked, differentiated and development-ready. Three indications. One mechanism. A clear path to NDA and IPO by 2027–2028.

466

Molecules Screened

Rigorous discovery program yielding 7 candidate drugs and 19 granted patents.

100%

IIT Remission Rate

Every enrolled patient achieved complete clinical remission across all dermatitis indications.

>90%

Radical Cure Rate

Durable, relapse-free outcomes confirmed at 4+ years — unprecedented in psoriasis.

3

Clinical Indications

Dermatology (Phase II), Ophthalmology (IND prep), IRI/IV (IND prep). One mechanism drives all three.

De-Risked: Dual IND approval (NMPA + FDA). Phase I completed with clean safety profile. IIT clinical data in hand.

Differentiated: No approved MyD88 inhibitor exists globally. NB-016 is first-in-class with no competitor near clinical use.

Near-Term Catalysts: Phase II interim data, IPO (HKEX 2027), NDA submission (2028), global licensing discussions underway.

NB-016: First-in-class small-molecule MyD88 inhibitor

The Unmet Need & The Root Cause

Non-infectious inflammatory diseases are the leading cause of chronic morbidity globally. Existing therapies, biologics, steroids, immunosuppressants, manage symptoms but cannot cure. The TLR/MyD88 pathway, as the universal trigger of innate immune activation, represents the first genuine opportunity for root-cause intervention.

Biologics
Target single cytokines downstream. Expensive, partial response, no cure.

Steroids
Broad immunosuppression. Significant side effects, no disease modification.

Signal Flow: How Disease Begins

MyD88 is the universal adaptor protein transducing signals from 13 of 14 TLR sub-families. Persistent dysregulation drives the full spectrum of non-infectious inflammatory diseases. Targeting MyD88 addresses the root cause, not downstream symptoms.

PAMPs / DAMPs

TLRs

MyD88

IRAK4 → TRAF6

NF-κB / AP-1 / IRF5 / IRF7

Pro-inflammatory Cytokines

Immune-Inflammatory Disease

Why MyD88?

Universal Adaptor
Transduces signals from 13 of 14 TLR sub-families.

Single Intervention Point
One target addresses the full spectrum of non-infectious inflammatory disease.

No Approved Inhibitor
World's first clinical-stage MyD88 inhibitor.

Asset
Blocks MyD88 at the signaling origin. Root-cause intervention.

NB-016: First-in-class small-molecule MyD88 inhibitor

Disease Expansion Strategy: Three Lead Programs, One Validated Mechanism

Initial development is focused on dermatology, ophthalmology, and ischemia-reperfusion injury, with broader expansion opportunities supported by published MyD88 biology.

Primary Development Targets (near-term value creation)

- Dermatology: Psoriasis, Atopic Dermatitis, Neurodermatitis
- Dry Eye Disease / Ocular Inflammation
- Ischemia-Reperfusion Injury (AMI, Stroke)

Future Expansion Opportunities

Autoimmune
Systemic lupus erythematosus, psoriasis, Crohn's disease, type 1 diabetes, multiple sclerosis

Transplant Rejection
Allograft rejection, graft-versus-host disease (GVHD)

Metabolic-Inflammatory
Obesity, fatty liver disease, type 2 diabetes, metabolic inflammatory syndrome

Neurodegeneration
Alzheimer's disease, depression, Parkinson's disease, schizophrenia

Inflammation-associated cancers
Chronic hepatitis → liver cancer, IBD → colorectal cancer, bronchitis → lung cancers

NB-016: First-in-class small-molecule MyD88 inhibitor

Competitive Landscape & Mechanism of Action

Competitive Landscape

Small-Molecule MyD88 Inhibitors

- NB-016: World's first MyD88 inhibitor in compassionate clinical use
- ST2825 (Sigma Tau, Italy): Laboratory reagent only; no clinical translation
- TIRAP/MyD88 inhibitor (Apion, Japan): Pre-clinical stage
- TLR inhibitors AS-2444697, PF-05387252: Lab experiments only
- NLR inhibitors (IFM, USA): Phase I (less clinically relevant pathway)

Monoclonal Antibody Approaches

Novartis, Pfizer, BMS, Veloxis, and J&J have all pursued TLR-targeting antibodies — with largely unsuccessful results, as no single disease is driven by a single TLR isoform.

Mechanistic Advantage of NB-016

MyD88 homodimerizes through its TIR domain. Continuous TLR stimulation drives excessive dimerization, triggering IRAK4, IRAK1/2, TRAF6, NF-κB, AP-1, IRF5, and IRF7.

NB-016 was designed to bind the Box3 region of the MyD88 TIR (Toll/Interleukin-1 Receptor) domain, preventing MyD88 homodimerization and interrupting downstream inflammatory signaling., binding to Ile179 and adjacent amino acids, specifically blocking TIR–TIR dimerization without affecting baseline immune competence.

First and only company globally with a small-molecule MyD88 inhibitor demonstrating clinical-stage human efficacy data.

NB-016: First-in-class small-molecule MyD88 inhibitor

Drug Discovery, IP & Development Pipeline

466

Bioactive Molecules
Synthesized and screened across multiple chemical scaffolds

26

Lead Compounds
Advanced through structure-activity relationship optimization

7

Candidate Drugs
Progressed into formal preclinical or clinical development programs

19

Patents Granted
13 invention patents + 6 international patents; US & EU grants confirmed

Development Pipeline

1. **Discovery & Optimization**
   466 molecules screened; 26 leads; NB-016 selected as lead NCE
2. **Preclinical / Tox**
   CRO-validated toxicology and pharmacokinetics supporting human dosing
3. **IIT / Compassionate Use**
   Investigator-initiated trials; dermatology, psoriasis first
4. **Formal Phase I / II**
   IND submission in preparation; BP 2025 target filing

Strategic Position

NB-016 is the lead NCE advancing through a structured development program, with IIT data already demonstrating clinical-stage human efficacy across multiple dermatological indications.

- Lead NCE with IIT-confirmed human efficacy
- Dual IND approval: China NMPA + US FDA
- 19 patents granted across US, EU, and China

IP Portfolio

13 Invention Patents
Core composition-of-matter and method-of-use claims

6 International Patents
US and EU grants confirmed

AI-Assisted Design
Proprietary scaffold optimization across aminothiazoles, imidazoles, piperidines

Wholly Owned IP
All rights held exclusively

NB-016: First-in-class small-molecule MyD88 inhibitor

1% Dermatitis Ointment: Rationale & Preclinical Proof

Strategic Rationale

Topical delivery provides high local drug concentration at the site of pathology, minimizes systemic exposure for an optimal safety profile, and offers a rapid proof-of-concept pathway for a first-in-class molecule. Psoriasis, a well-characterized TLR/MyD88-driven autoimmune disease, was selected as the lead indication.

Indication Scope

The 1% ointment is being developed as a multi-purpose topical agent for all categories of non-infectious dermatitis, including:

- Psoriasis (autoimmune): lead clinical indication
- Atopic dermatitis / eczema
- Neurodermatitis
- Proteinosis dermatitis
- Allergic contact dermatitis

Preclinical Data: Comparison with Tapinarof

In the IMQ (imiquimod)-induced murine psoriasis model, the gold-standard preclinical test, 1% ointment demonstrated complete normalization of skin thickness and histology by Day 7, outperforming 1% Tapinarof, the most recently approved topical comparator.

IMQ-Model Preclinical Results: NB-016 vs. 1% Tapinarof

Metric	1% Ointment	1% Tapinarof
Epidermal thickness normalization	**Day 7 (complete)**	Not achieved at Day 7
Macroscopic skin appearance	**Fully normalized by Day 7**	Partial improvement
Inflammatory cell infiltrate	**Cleared by Day 7**	Reduced, not cleared
Erythema & scaling (Day 3)	**Significant reduction**	Mild reduction
Overall outcome	**Superior**	Comparator

NB-016: First-in-class small-molecule MyD88 inhibitor

IIT Clinical Design & Psoriasis Results: 100% Cure Rate

Study Framework

Compassionate use therapy IIT conducted at the Department of Dermatology, Wuhan Central Hospital, affiliated with Huazhong University of Science and Technology. All patients provided written informed consent. Ethics approval was based on CRO-validated preclinical toxicology and pharmacokinetic data.

- Physician-guided topical application
- Photographic documentation at each visit
- Structured follow-up with outcome recording
- PGA and PASI scoring applied for psoriasis quantification

Institution & Ethics
Dept of Dermatology, Wuhan Central Hospital (Huazhong UST). Ethics Ref. 2018-12; CRO-validated preclinical tox & PK data.

Scoring
PGA (Physician Global Assessment) + PASI (Psoriasis Area Severity Index)

Follow-up
Structured visits with photographic documentation at each timepoint

100%

PGA 0/1 Clearance

At 2 weeks. Tapinarof: 66.3% at 12 wks. Calcipotriol: 63.9% at 12 wks.

100%

PASI75 at 16 Weeks

87.5% at 4 weeks; 100% at 16 weeks. Tapinarof: 50.4% at 12 wks.

>90%

Radical Cure Rate

3 cases: 4+ years relapse-free. 1 case: 1+ year. No cure on record for any approved therapy.

No currently approved medication, biologic or small-molecule, has demonstrated radical cure in psoriasis. NB-016 is the first.

NB-016: First-in-class small-molecule MyD88 inhibitor

Clinical Responses Across Multiple Dermatologic Conditions

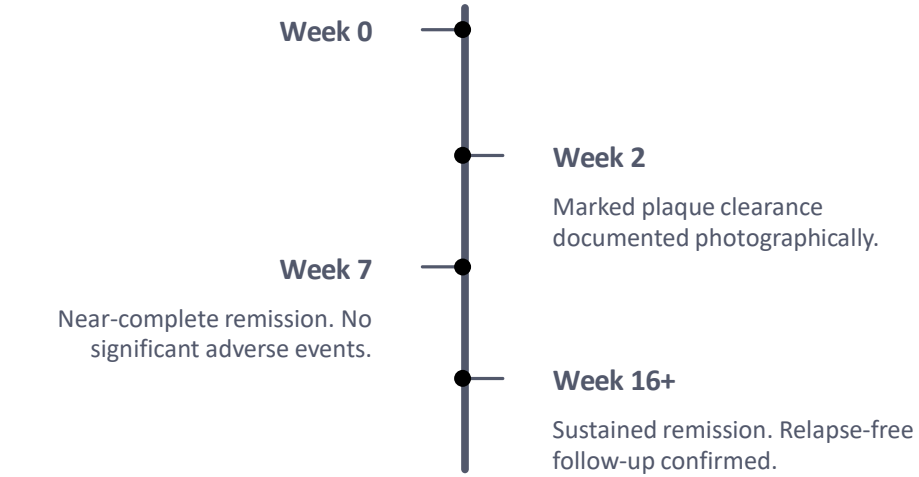
This asset demonstrated curative outcomes across every dermatological indication treated under the compassionate use framework.

Additional Dermatology Cases Treated

Condition	Outcome
Atopic Dermatitis (Eczema)	Rapid itch reduction and lesion clearance
Neurodermatitis	Sustained remission during follow-up
Chronic Refractory Dermatitis	Significant improvement after failure of prior therapies

Case #10 — Male, 48 · Psoriasis

Diagnosed with psoriasis for 10 years with no prior effective treatment. After 2 weeks of 1% NB-016 ointment, marked plaque clearance documented photographically. After 7 weeks, near-complete remission with no significant adverse events.



Case #6 — Female · Atopic Dermatitis

Significant reduction in erythema, scaling and pruritus within 14 days; progressive clearance confirmed through full treatment period.

NB-016: First-in-class small-molecule MyD88 inhibitor

Total IIT Summary: One Drug. All Indications. Curative.

Across every enrolled patient and every indication, NB-016 delivered outcomes no approved therapy has ever achieved.

Rapid Onset

Symptom relief measurable within minutes to hours of first application

>90% Radical Cure

Durable, relapse-free outcomes sustained for up to 4+ years post-treatment

100% Complete Remission

Every enrolled patient achieved full clinical remission across all dermatitis types

Skin Restoration

Reduced scar tissue formation and pigmentation; measurable skin whitening and texture improvement

No currently approved medication, biologic or small-molecule, has demonstrated radical cure in psoriasis. NB-016 is the first.

NB-016: First-in-class small-molecule MyD88 inhibitor

IIT Clinical Cases: Photographic Evidence

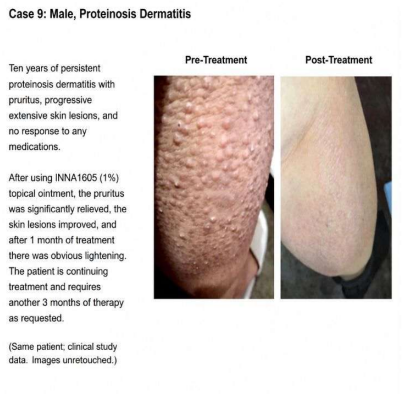
Serial photographic documentation across all IIT cases confirmed progressive lesion clearance, results for clinical research only; distribution prohibited.

Case 5 — Neurodermatitis (Female)

Refractory scalp and periscapular neurodermatitis. Erythema resolved by week 2; no relapse at 3-year follow-up.

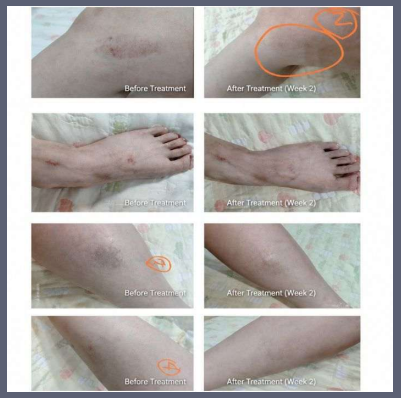
Case 9 — Proteinosis Dermatitis (Male)

>10 years' duration, refractory to all prior therapy. Pruritus resolved rapidly; lesions significantly reduced within 1 month.



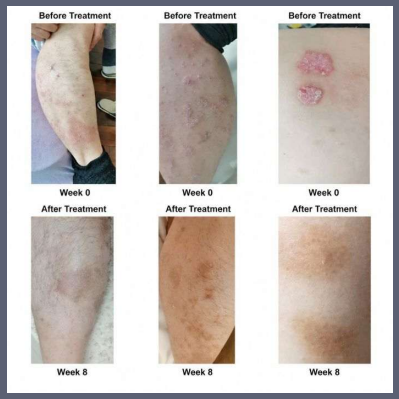
Case 6 — Atopic Dermatitis (Female)

Marked reduction in erythema and scaling at 2 weeks; progressive clearance confirmed.



Case 10 — Psoriasis, Male 48 (10-year history)

Near-complete plaque resolution at 2 and 7 weeks.



NB-016: First-in-class small-molecule MyD88 inhibitor

Phase I Safety Data & Development Timeline

NB-016 has received dual IND approval from China's NMPA and the US FDA, all Phase I cohorts completed with no drug-related adverse events requiring intervention.

Group	n	Completion	Withdrew (AE)	Drug-Related AE	Conc.-Dependent AE
SAD 1% (60 mg)	8	100%	0	1 occasional bradycardia (not conc.-related; no tx required)	0/32
SAD 3% (180 mg)	8	100%	0	0	0
SAD 3% (270 mg)	8	100%	0	0	0
MAD 3% QD (160 mg/day)	8	100%	0	0	0/8
MAD 3% QD (320 mg/day)	8	100%	0	1 premature beat; conc.-independent; no tx required	0/8

PK Parameters (Maximum Dose)

SAD 360 mg:

- Cmax: 514.5 ± 122.78 pg/mL
- Tmax: 24 ± 6 h
- AUClast: 10,306 ± 2,856 h·pg/mL

MAD 320 mg/day: No unexpected events; data in processing.

Conclusion

No clinically significant drug-related AEs at any dose level. NB-016 demonstrates a favourable safety profile.

Phase II may proceed.

Now

Phase II underway. Financing and licensing in progress.

2027

Planned IPO on Hong Kong Stock Exchange.

2028

IPO on China A-share / NASDAQ post Phase II.

2028

NDA submission. Global licensing to pharma partners.

NB-016: First-in-class small-molecule MyD88 inhibitor

Indication 2: Ophthalmic Ointment for Dry Eye Syndrome

The same MyD88 inhibition mechanism that cures psoriasis also addresses dry eye syndrome (DES), Sjögren's syndrome, and allergic conjunctivitis — a $5B+ market with no disease-modifying treatment.

Disease Profile

- Affects 20–30% of adults globally
- No approved disease-modifying therapy
- Rapid regulatory pathway via topical formulation

Scientific Rationale

Peer-reviewed evidence confirms MyD88 as a central mediator of dry eye-induced corneal damage:

- MyD88 Deficiency Protects Against Dry Eye-Induced Damage. *Invest Ophthalmol Vis Sci.* 2018;59(7):2967–2976.
- Myd88 required in primary Sjögren's syndrome mouse model. *J Leukoc Biol.* 2017;102(6):1411–1420.
- Toll-like receptors in ocular surface disease (review). *Exp Eye Res.* 2010;90(6):679–87.

Market Opportunity

- $5B+ addressable market
- 20–30% adult prevalence globally
- No disease-modifying competitor
- Rapid IND pathway via topical formulation

$5B+

Market Size

20–30%

Adult Prevalence

0

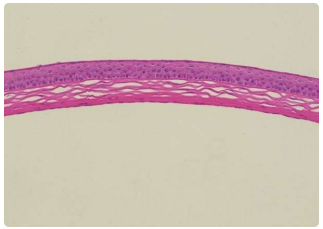
Approved Disease-Modifying Therapies

NB-016: First-in-class small-molecule MyD88 inhibitor

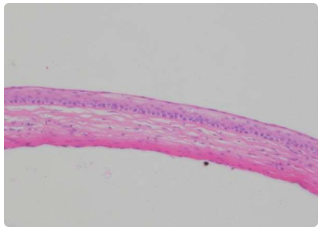
Dry Eye Preclinical Evidence and Development Status

Fluorescein staining of corneal epithelium quantifies surface damage in a murine dry eye model. Reduced fluorescent signal indicates therapeutic response. Histopathological sections confirm complete structural restoration after 14 days of 2% INNA1605 eye ointment.

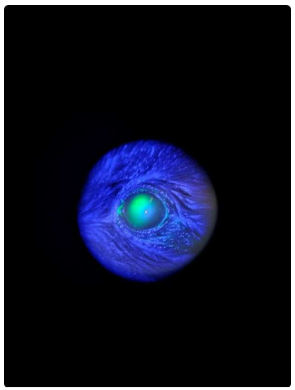
Normal Cornea — Control
Intact, stratified epithelium with regular surface architecture. Histological reference standard.



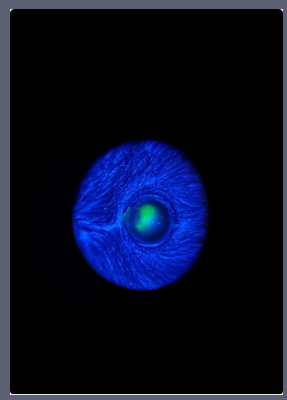
Untreated Dry Eye Syndrome
Marked epithelial disruption with erosion, thinning and loss of cellular integrity from MyD88-driven inflammation.

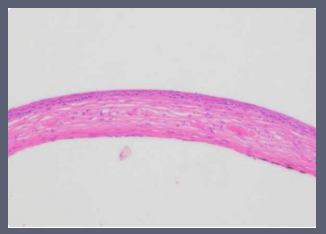


Day 10 — Partial Response
Visibly reduced corneal fluorescein staining vs. untreated controls. Epithelial damage scores decreased across all treated animals.



Day 14 — Full Recovery
Fluorescein staining fully eliminated. Epithelial architecture completely restored — indistinguishable from normal control.





Day 7
Fluorescein Reduction First Observed

Day 14
Complete Epithelial Restoration Confirmed

100%
Treated Animals Achieving Full Recovery

NB-016: First-in-class small-molecule MyD88 inhibitor

Indication 3: IV Formulation for Ischemia-Reperfusion Injury

NB-016 is an intravenous MyD88 inhibitor targeting ischemia-reperfusion injury (IRI), the acute inflammatory cascade triggered when blood flow is restored after AMI or ischemic stroke. No approved pharmacological treatment exists. A successful MyD88 inhibitor would be the first of its kind.

❤️ Heart (AMI)

IRI accounts for up to 50% of final infarct size. No approved pharmacotherapy targets the reperfusion injury itself.

🧠 Brain (Stroke)

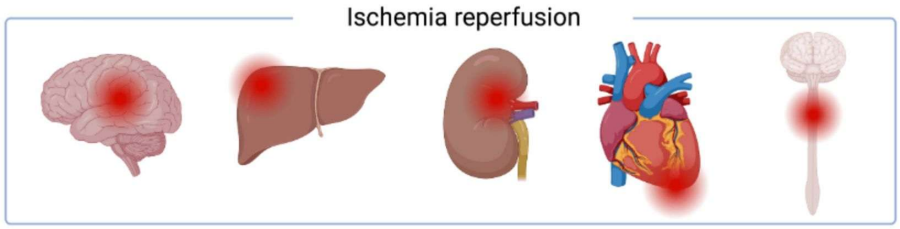
Cerebral IRI drives neurological deficits post-stroke. tPA and thrombectomy cannot prevent IRI-mediated damage.

🫁 Liver / Kidney / Lung

IRI is the principal cause of primary graft non-function in solid organ transplantation. Animal studies complete with published results.

In AMI, ischemic DAMPs activate TLR/MyD88 signalling, triggering a cytokine storm that amplifies necrosis 3–4× beyond the initial ischemic zone on reperfusion. NB-016 interrupts this cascade at its molecular origin.

Preclinical Data: 70% Necrosis Reduction



Untreated IRI

Necrosis expands beyond the ischemic core into a substantially larger IRI-extended zone. No pharmacological intervention exists. Result: permanent myocardial loss, reduced ejection fraction and elevated mortality.

Treatment

MyD88 inhibition breaks the inflammatory amplification loop at reperfusion. IRI-mediated necrosis is fully suppressed. Final necrotic area reduced by 70%.

IRI can be fully prevented with MyD88 inhibitor treatment. This is the first drug candidate to demonstrate this across multiple organ systems.

Animal experiments across all organ IRI indications are complete. Results published in peer-reviewed journals.

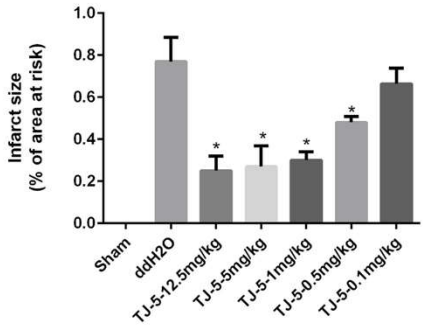
NB-016: First-in-class small-molecule MyD88 inhibitor

Protection Against Reperfusion Injury

NB-016 is the world's first small-molecule MyD88 inhibitor demonstrated to prevent ischemia-reperfusion injury (IRI) across multiple organ systems. Intravenous administration reduces necrotic area by up to 80% in validated cardiac and cerebral infarction models.

The Reperfusion Problem

68% of total myocardial infarct area is attributable to reperfusion injury. Only 32% results from ischemia alone. The majority of infarct damage is preventable.



Dose-Response Evidence

Across doses from 1 to 12.5 mg/kg IV, TJ-5 significantly reduced infarct size versus ddH_2O control. The optimal range of 1 to 5 mg/kg showed statistically significant reduction ($p<0.05$), confirmed in both myocardial and cerebral models with necrosis reduction of 70 to 80% across tissue types.

Source: Miao, Yan et al. American Journal of Translational Research, vol. 12,9: 5151–5169. Sep. 2020.

80%

Max Necrosis Reduction

68%

Infarct Area from Reperfusion

70–80%

Necrosis Reduction Across Tissue Types

NB-016: First-in-class small-molecule MyD88 inhibitor

IRI Program Development Plan and Commercial Opportunity

NB-016's IRI program is the company's most validated pipeline, with preclinical data across cardiac, cerebral, hepatic, renal, and pulmonary models. The same MyD88 mechanism is now being extended into CNS indications, specifically Major Depressive Disorder, via an oral formulation.

IRI: Completed Milestones

- CMC development and pilot-scale production
- Sino-US dual IND declaration documents prepared
- Preclinical studies including DSE and DMPK
- Pharmacodynamics and formulation studies
- Compassionate treatment clinical case data collected

IRI: Upcoming Milestones

3 to 5 Months
Long-term toxicology completed; IND filed in China and USA

~6 Months
Phase I clinical trial completed

~12 Months
Phase II initiated; Priority Listing designation sought

~18 Months
Phase III with NDA submission

IRI Preclinical Scope

Cardiac
Myocardial infarction; 70–80% necrosis reduction

Cerebral
Ischemic stroke; confirmed in cerebral infarction models

Hepatic / Renal / Pulmonary
Multi-organ validation completed

MDD Preclinical Evidence

In a validated repeated brief deprivation stress model, TJ-M2010-5 prevented depressive-like behaviors and suppressed neuroinflammatory markers, with significant improvements across behavioral endpoints consistent with antidepressant efficacy. *(Source: Brain, Behavior, and Immunity 108 (2023) 204–220.)*

MDD Behavioral Data
TJ-M2010-5 significantly reduced depressive-like behavior scores vs. control in validated stress models.

Neuroinflammation Suppression
MyD88 inhibition reduced microglial activation and pro-inflammatory cytokine expression in CNS tissue.

Commercial Strategy — Full Pipeline Optionality

Dermatology Ointment
Eczema, neurodermatitis, urticaria. Large market; favorable regulatory pathway.

Mucosal & Ophthalmic
Rhinitis nasal drops, asthma inhalants, dry eye drops, organ preservation.

Cardiac & Cerebral IRI (IV)
AMI, cerebral infarction, vein graft protection. Most mature preclinical package.

GI Oral Preparations
Colitis, colorectal cancer, gastritis, gastric cancer.

NB-016: First-in-class small-molecule MyD88 inhibitor

First-in-Class Across Three Development Programs

One mechanism. Three development programs. Each targeting a large market with no approved curative therapy.

Programs

1. Dermatology Ointment

Psoriasis, atopic dermatitis, neurodermatitis. Phase II underway. Dual IND. 100% remission in IIT. NDA/IPO target 2027–2028.

2. Ophthalmic Ointment

Dry eye, Sjögren's, allergic conjunctivitis. Preclinical complete. IND preparation underway.

3. IV Formulation (IRI)

AMI and ischemic stroke. First-in-class. 70% necrosis reduction in animal models.

Platform Advantages

Unique Mechanism

No approved MyD88 inhibitor exists globally. INNA1605 is first-in-class across dermatology, ophthalmology and emergency medicine.

Clinical Validation

9+ psoriasis cases with 100% clearance and >90% radical cure. PASI outcomes exceed all approved therapies. Phase I safety confirmed.

Regulatory Readiness

Dual IND approval (China NMPA and US FDA). Phase II ongoing. NDA and IPO targeted for 2027 to 2028.

Actively seeking financing and strategic licensing partners. Qualified investors and pharma partners are invited to engage.

NB-016: First-in-class small-molecule MyD88 inhibitor

Investment Thesis: A Platform Compound

NB-016 is a platform compound, not a single-indication drug. Validated across cardiac, cerebral, dermatological, neuropsychiatric and oncological models, it targets one of the most consequential pathways in modern medicine.

First-in-Class

No approved MyD88 inhibitor exists. NB-016 will define a new therapeutic category.

De-Risked Preclinically

Multi-model efficacy data, completed CMC and compassionate use clinical signals substantially reduce early-stage development risk.

Near-Term Catalysts

IND filings in China and the US within 3 to 5 months provide clear, near-term value-creation milestones.

Platform Optionality

13+ indications across 5+ formulation types offer exceptional upside and portfolio diversification from a single validated mechanism.

We are actively seeking strategic financing and licensing partners. Qualified investors and pharma partners are invited to engage.

Accelerating Innovation to Improve Patients' Lives

Navika Bio connects groundbreaking biotech innovation with global pharmaceutical partners to deliver transformative therapies to patients worldwide.

NAVIKA BIO

Let's Connect

For more information about partnership opportunities and to join us on this exciting journey of bringing transformative therapies to patents worldwide, please reach out to:

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