HEALTHCARE MARKET INTELLIGENCE · IMMUNOLOGY

From White Space to Benchmark Space

What the next wave of HS therapies must prove — why IRAK4, IL-1-axis therapies, and oral immunology assets now need *proof of position*, not just proof of biology.

> *"In HS, the next therapy will not win because the pathway makes sense. It will win because the product profile makes sense."*

Prepared by	Techspert
Landscape data	Intangia
Reading time	~18 minutes

01 · EXECUTIVE SUMMARY

HS is no longer a white-space opportunity. It is benchmark space.

Hidradenitis suppurativa is no longer a category that can be described adequately by unmet need alone. It remains painful, stigmatizing, structurally underdiagnosed, and underpenetrated by advanced therapy.[3,4,8] But the treatment landscape has changed materially. Adalimumab established the first disease-modifying biologic benchmark; secukinumab and bimekizumab expanded the biologic bar; next-generation IL-17A/F agents are advancing; and oral therapies are beginning to define a new competitive layer.[5,6,7,8,9]

The issue is no longer whether HS needs better therapies. It is what kind of new therapy can credibly earn a place in a market where efficacy, durability, safety, convenience, access, and evidence quality are now judged against a visible standard. **This is the shift from white space to benchmark space.**

That shift is especially important for the IL-1/TLR–IRAK4 innate immune axis. IRAK4 remains a compelling target because it sits downstream of IL-1 receptors and toll-like receptors through MyD88 / myddosome biology, making it a receptor-proximal node in inflammatory amplification. But proximality is not position. KT-474 generated strong Phase 1 target-engagement data, but the later HS Phase 2 study was terminated without public randomized efficacy results.[2,14,15]

This paper, therefore, reframes IRAK4 not as the whole story, but as a test case for the next wave of HS innovation. The same burden of proof applies to IL-1-family therapies, JAK inhibitors, IL-17A/F agents, and other oral or upstream immunology approaches: mechanisms must become positions.

CENTRAL THESIS

The next wave of HS therapies — including IRAK4, IL-1-axis approaches, JAKs, and IL-17A/F agents — must prove *position*, not just biology.

FROM	TO
Unmet need as the core rationale	Benchmark clearance as the core test
Pathway plausibility	Product-position plausibility
HiSCR50 as enough	Deeper response, durability, pain, drainage, sinus-tract impact
Mechanism-led narratives	Evidence-led target product profiles
"Could this work?"	"Where would this fit, and why would clinicians use it?"

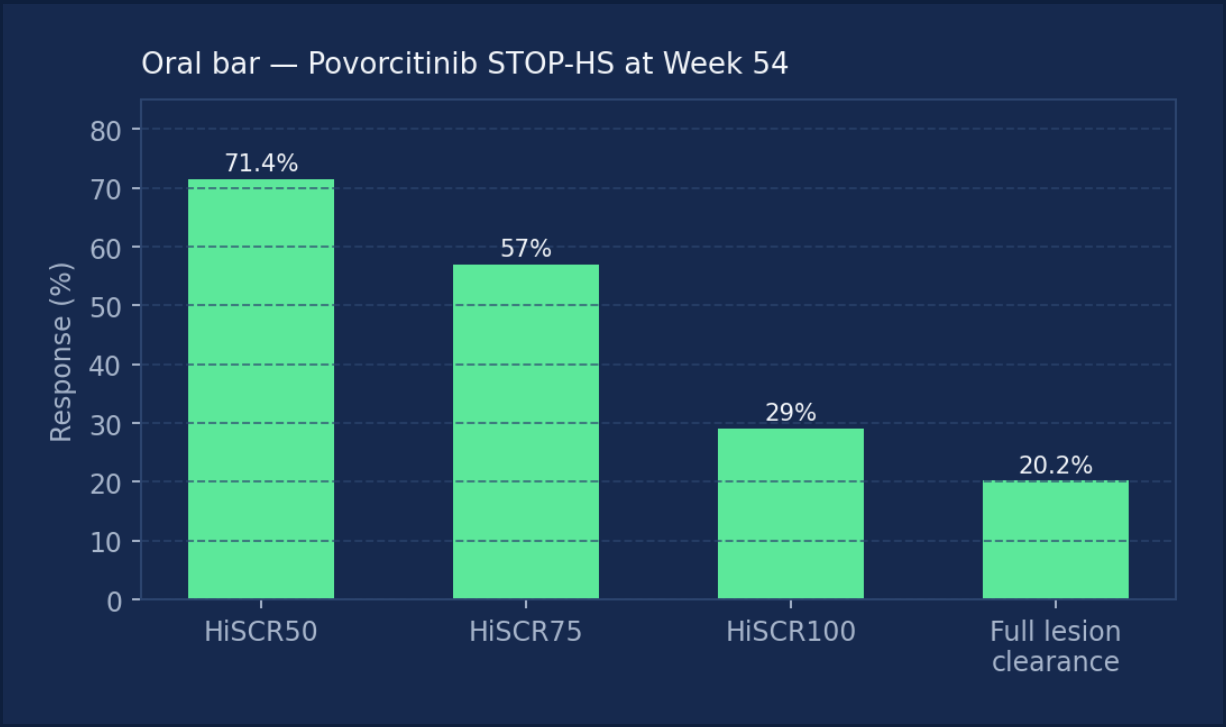
The strategic shift in HS innovation.

02 · WHY THIS MATTERS NOW

The development environment has become less forgiving.

Across immunology, mechanistic novelty still matters, but it no longer carries the same standalone value. Senior decision-makers ask harder questions earlier: what differentiates this mechanism from adjacent options, what evidence will make it credible in a crowded market, and does the asset have a realistic path to a target product profile that justifies capital and organizational focus?

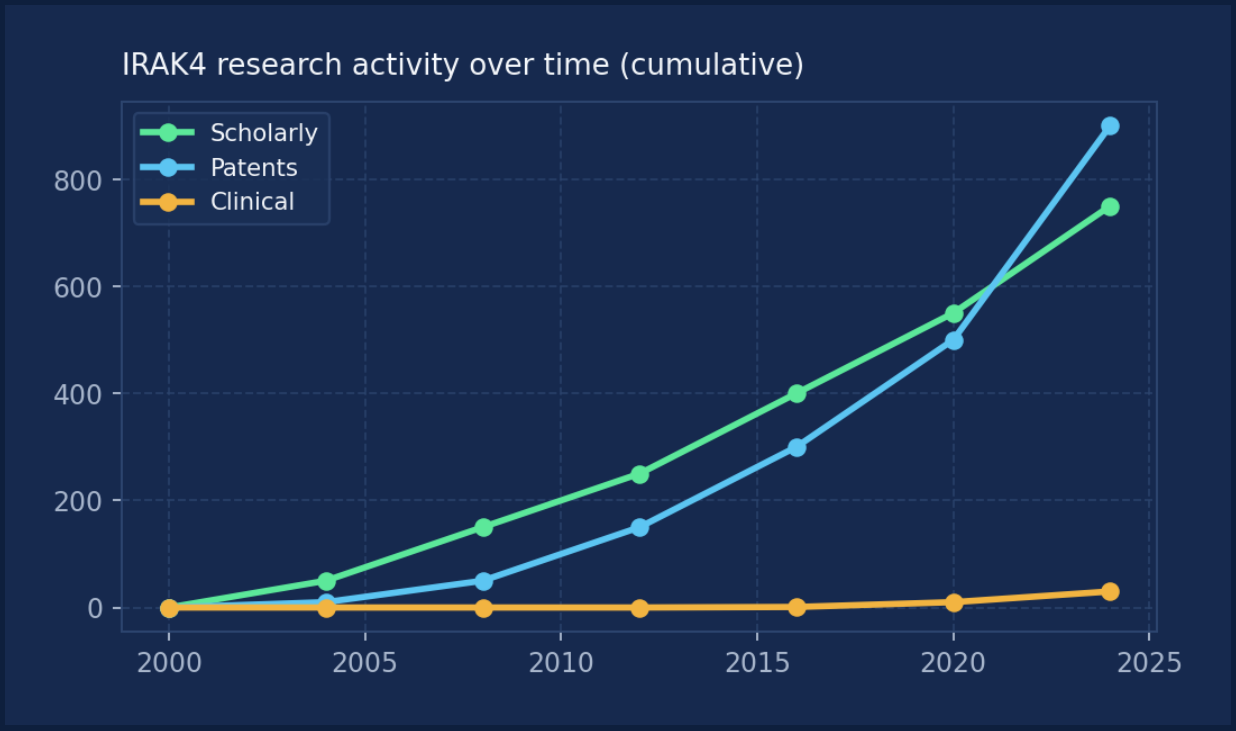
Incyte's 54-week Phase 3 STOP-HS data for povorcitinib reported responses of up to 71.4% HiSCR50, 57% HiSCR75, 29% HiSCR100, and full resolution of abscesses, inflammatory nodules, and draining tunnels in up to 20.2% of patients.[9] Oral convenience alone is no longer enough.



Oral convenience alone is no longer enough. The next oral entrant is judged against this depth-of-response curve. [9]

The IRAK4 ecosystem is no longer early or speculative. The landscape shows more than 15 years of research maturity, 12 clinically active companies, 725 scholarly outputs, 893 patents, 47 deals and 215 investors.[1]

MATURITY	MOMENTUM	COMPETITION	TRANSLATION	RISK
15+ yrs	**+7%**	**12 cos.**	**Phase 2**	**8–15%**
Of research history	vs 3-yr average	Clinically active	Latest stage	Estimated success



IRAK4 is not a frontier target. It is a mature, active, increasingly modality-sensitive field. [1]

03 · HS HAS ENTERED BENCHMARK SPACE

From absence of options to layered competition.

A disease category enters benchmark space when unmet need stops being the main comparative reference point. New therapies are judged against an explicit bar of efficacy, durability, safety, convenience, access, evidence quality, and line-of-therapy fit.

BENCHMARK SPACE — THE NEW BAR

Efficacy · Depth of response · Durability · Safety · Convenience · Access · Evidence quality · Line-of-therapy fit

The next therapy cannot rely on pathway logic alone. It must prove where it belongs.

MOMENT	MILESTONE	STRATEGIC MEANING
Adalimumab era	First disease-modifying biologic benchmark	Biologic benchmark logic established
Secukinumab approval	IL-17A expands biologic landscape	More mechanisms enter approved care
Bimekizumab / BE HEARD	IL-17A/F raises efficacy & durability	Benchmark shifts upward
Secukinumab pediatric	Pediatric HS label	Category matures beyond adult-only framing
Povorcitinib Phase 3	Oral JAK1 signal through Wk 54	Oral convenience is no longer enough
Sonelokimab Phase 3 VELA	IL-17A/F competitor on HiSCR75	Deeper endpoints matter
AVTX-009 LOTUS	IL-1β Phase 2 complete; results pending	IL-1 biology live but unproven
KT-474 Phase 2 termination	No disclosed randomized HS efficacy	IRAK4 conviction bar rises

HS has moved from absence of options to layered competition. [4,5,6,7,10,12]

> *"The landscape has moved from barren to improved — but it's good, not excellent."*
> **— Gibran Shaikh, MD**[3]

04 · DISEASE BURDEN & PATIENT JOURNEY

HS is a care-pathway and burden-of-life disease — not a lesion-count disease.

HS affects approximately 0.4–1.0% of the global population, with substantial disability, mental-health burden, and work impairment.[8] Diagnostic delay frequently stretches years.[8] By the time many patients reach advanced therapy, cumulative inflammatory damage — scarring, sinus tracts, draining tunnels — may already constrain what disease modification can achieve.[3]

> *"Patients come very late to therapy… there are delays in diagnosis, recognition of disease… there are definitely some structural barriers."*
>
> **— Gibran Shaikh, MD[3]**

BURDEN DIMENSION	EVIDENCE POINT	STRATEGIC IMPLICATION
Prevalence	~0.4–1.0% global (BE HEARD)	Under-recognized inflammatory market
Diagnostic delay	Often prolonged, frequently years	Patients arrive late; early disease modification difficult
Disability / QoL	Substantial daily-life impact	Burden extends beyond lesion counts
Mental health	Meaningful depression / anxiety burden	PROs matter commercially
Work impact	Absenteeism & impairment common	Economic burden strengthens value argument
Under-treatment	KOLs describe advanced-therapy underuse	Opportunity exists, but adoption is friction-heavy

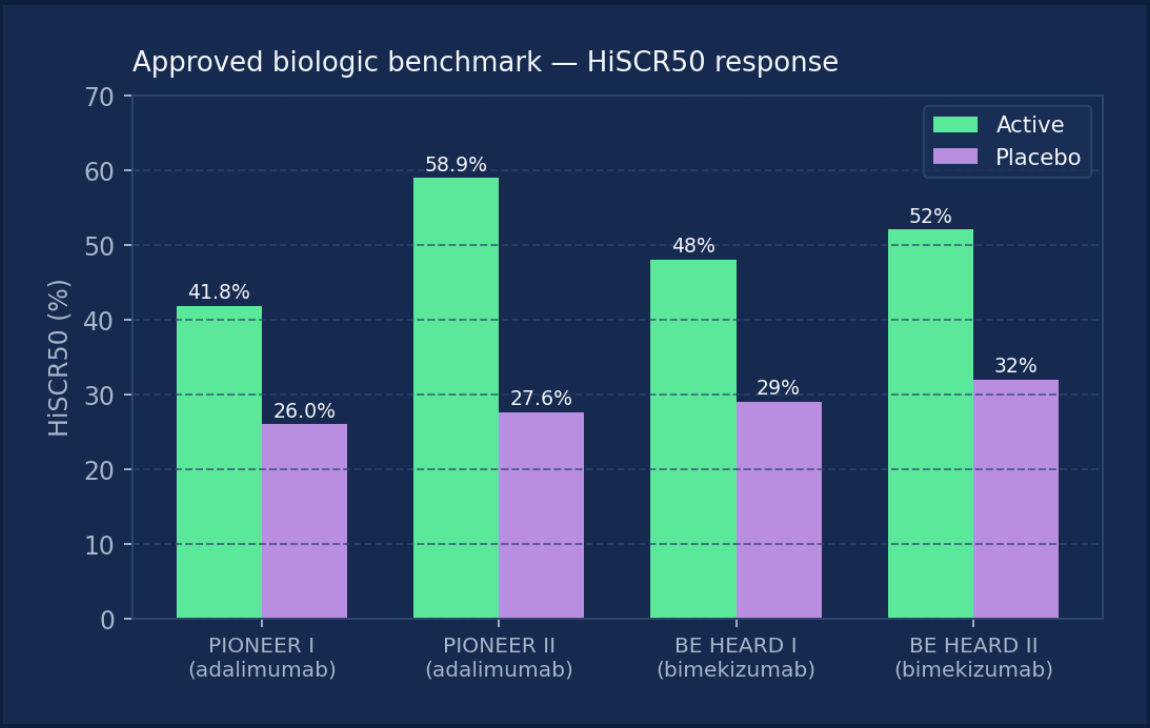
HS burden across five clinically relevant dimensions. [3,4,8]

> *"I probably see two to three HS patients a day. Probably one of them is on a biologic."*
>
> **— Kevin Kia, MD[4]**

05 · THE TREATMENT BENCHMARK HAS MOVED

The bar has moved upward — but it has not closed the market.

Adalimumab established the first disease-modifying reference point in PIONEER I and II.[5] Secukinumab expanded the landscape with SUNSHINE / SUNRISE[6] and a pediatric label.[7] Bimekizumab raised the conversation with BE HEARD I and II, where 320 mg q2w achieved HiSCR50 at Week 16 in 48% and 52% of patients versus 29% and 32% on placebo, with responses maintained or increased through Week 48 — putting durability into the bar itself.[8]



Cross-trial comparisons are directional only. Endpoints, populations, and timing vary; this visual shows benchmark formation, not head-to-head ranking. [5,8]

> *"I do think Bimzelx really is a step-wise improvement."*
>
> **— Gibran Shaikh, MD**[3]

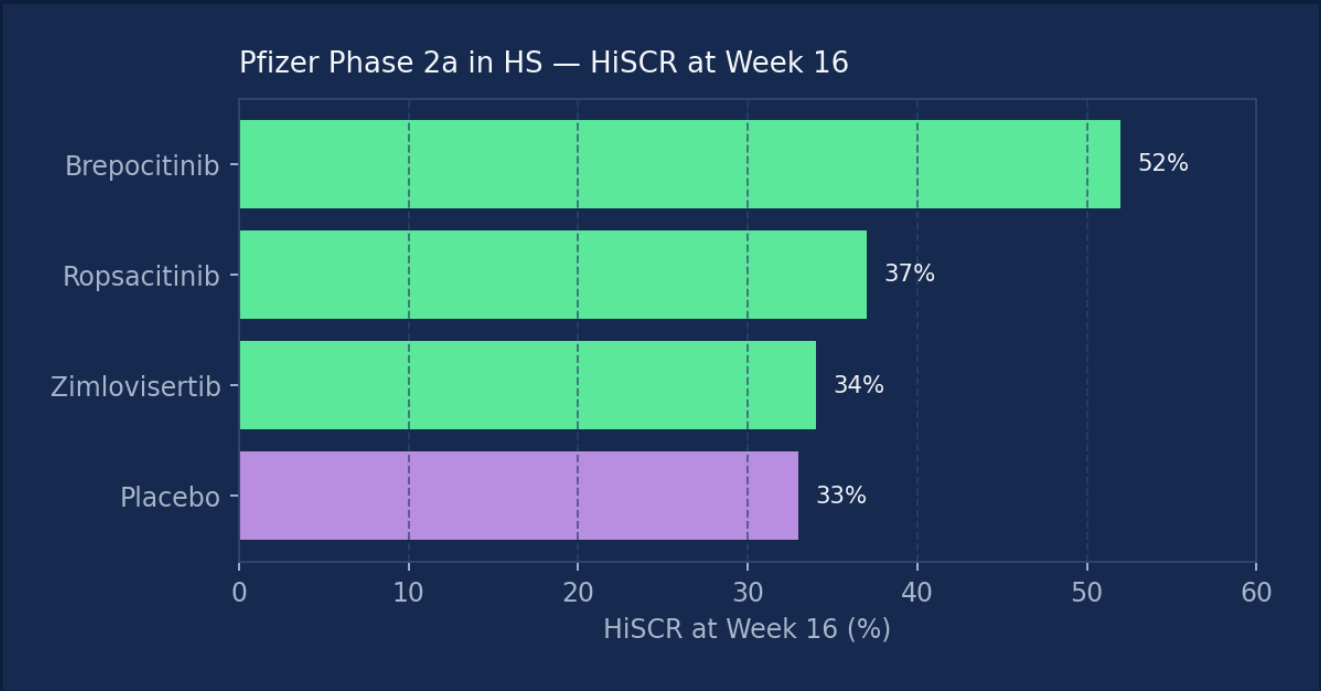
But the clinician view keeps this grounded. Shaikh describes Humira as a major game changer, but one that can be 'middling' in more severe patients. He sees Bimzelx as a step-wise improvement, while noting access and fungal infection issues.[3] Kia similarly says Bimzelx has been 'nice to have' and offers a different mechanism, but is 'not like a wonder drug.'[4] The bar has moved, but it has not closed the market.

> *"It's not like a wonder drug that cures everybody, but it's been nice to have a different mechanism of action."*
>
> **— Kevin Kia, MD**[4]

06 · THE NEXT WAVE

Oral, IL-1, IL-17A/F and IRAK4 competition.

Povorcitinib is the clearest example of the emerging oral benchmark.[9] Pfizer's Phase 2a is especially relevant to the IRAK4 question: at Week 16, HiSCR was 52% for brepocitinib, 34% for zimlovisertib, 37% for ropsacitinib and 33% for placebo. Zimlovisertib — an IRAK4 kinase inhibitor — looked essentially placebo-like.[10] This does not invalidate IRAK4 as a target, but it weakens kinase-only inhibition as the basis for a differentiated HS thesis.



Zimlovisertib (IRAK4 kinase inhibitor) looked essentially placebo-like — a cautionary signal for kinase-only IRAK4 strategies in HS. [10,16]

IL-1-family biology also remains active. Lutikizumab, a dual IL-1α/IL-1β antagonist, showed positive Phase 2 effects in anti-TNF inadequate responders and is moving into Phase 3.[11] AVTX-009 (abdakibart), an anti-IL-1β antibody, has completed its LOTUS Phase 2 readout.[13] In parallel, sonelokimab has reported Phase 3 VELA data with mixed but clinically meaningful signals.[12]

ASSET	MECHANISM	STAGE	KEY SIGNAL	STRATEGIC IMPLICATION
Povorcitinib	Oral JAK1	Ph3 Wk 54	71.4% HiSCR50 / 57% HiSCR75 / 29% HiSCR100	Oral bar is real
Brepocitinib	JAK1/TYK2	Ph2a Wk 16	52% vs 33% placebo	Oral immunology can separate
Zimlovisertib	IRAK4 kinase	Ph2a Wk 16	34% vs 33% placebo	Cautionary signal for kinase-only IRAK4
Lutikizumab	IL-1α/β antagonist	Ph2 → Ph3	Positive in anti-TNF failures	IL-1 biology remains live
AVTX-009	IL-1β antibody	Ph2 LOTUS done	HiSCR75 42.2 / 42.9% vs 25.6% placebo	Near-term IL-1 watchpoint

ASSET	MECHANISM	STAGE	KEY SIGNAL	STRATEGIC IMPLICATION
Sonelokimab	IL-17A/F Nanobody	Ph3 VELA	HiSCR75; mixed interpretation	IL-17A/F space is tightening
KT-474/485	IRAK4 degrader	Ph1 / next-gen	Strong PD; no randomized efficacy	Needs proof of position

Cross-trial comparisons are directional only. Not adjusted head-to-head. [9,10,11,12,13,14,15,16]

> *"The JAK inhibitors are going to come with their black-box warnings… even if the data are impressive, it's going to end up being something we use less often."*
> **— Kevin Kia, MD**[4]

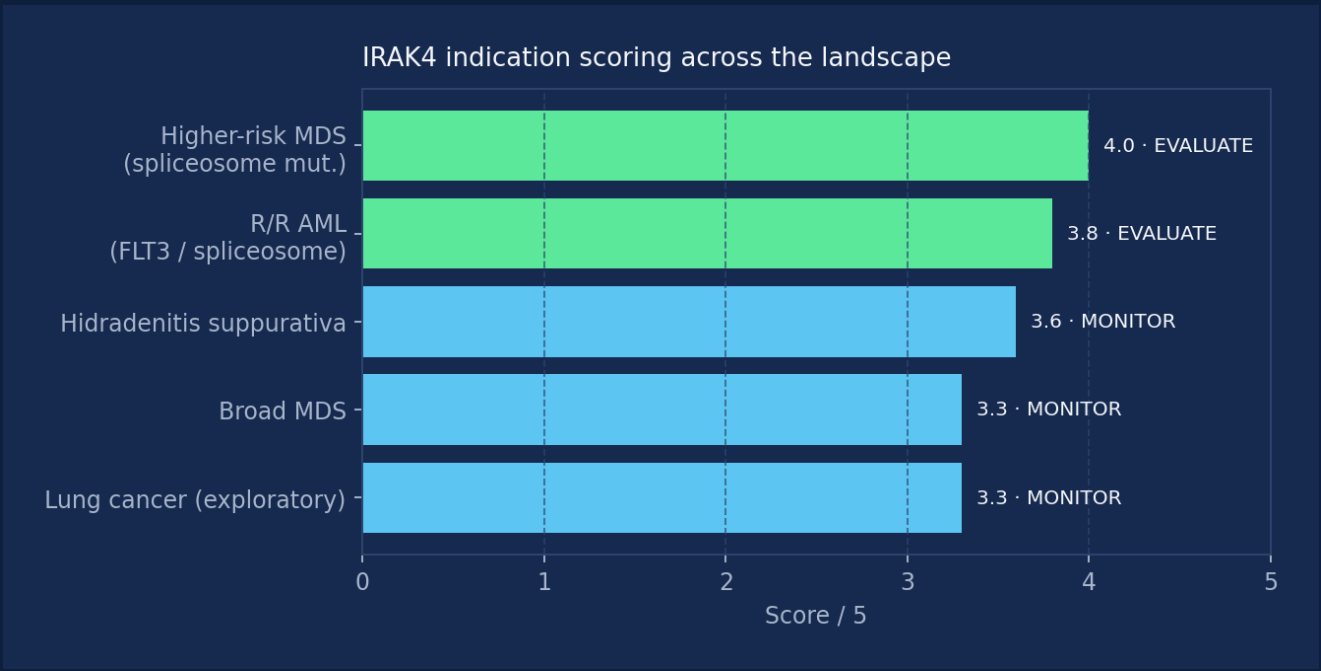
The real comparator for IRAK4 is no longer placebo. It is the combined biologic-plus-oral benchmark bar.

07 · IRAK4 AS THE TEST CASE

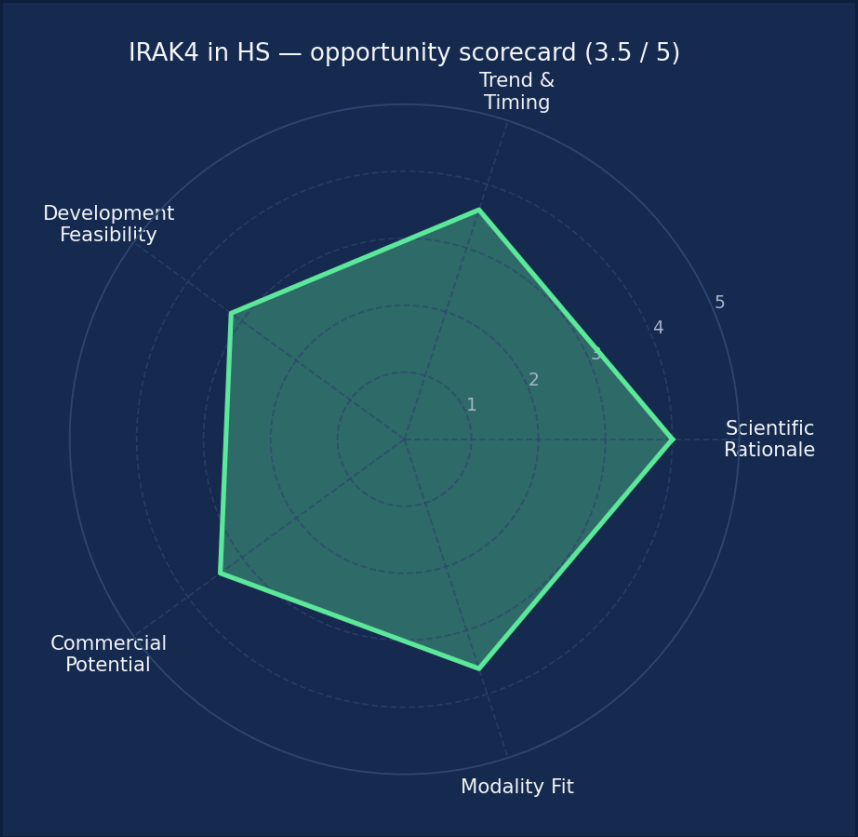
Receptor-proximal, biologically plausible — but proximality is not position.

IRAK4 sits immediately downstream of IL-1 receptors and toll-like receptors, operating through MyD88 and the myddosome to activate NF-κB and MAPK pathways.[2,14] The most accurate framing is the **IL-1/TLR–IRAK4 axis**: accessible to clinicians, precise enough for technical readers.

HS is biologically plausible because the disease is marked by innate inflammatory amplification — IRAK4 is overexpressed in lesional skin versus non-lesional, with increasing IRAK4-positive immune-cell infiltration as severity rises.[2] Yet tissue-level plausibility is not a fully de-risked therapeutic case.[1]



HS is strategically relevant, but not the clearest lead-value indication in the broader IRAK4 landscape today. [1]



Commercial value hinges on modality-driven differentiation and biomarker-defined indications, rather than me-too IRAK4 kinase inhibition. [1]

08 · MODALITY IS STRATEGY

Inhibition, degradation, scaffold disruption — and why it matters.

IRAK4 has both kinase and scaffold functions.[1,2] A kinase inhibitor may suppress enzymatic activity while leaving structural myddosome assembly intact. If scaffold biology is clinically meaningful, kinase inhibition may not be deep enough.[1] PROTAC degraders (KT-474, BGB-45035) eliminate both kinase and scaffold function by removing IRAK4 protein itself.[1,14]

CONTROL AXIS	ANCHOR NODES	INFERRED CONSTRAINT
Myddosome assembly control	MyD88 · IRAK4	Persistence of MyD88-IRAK4 complex gating NF-κB / MAPK downstream of innate receptors
Kinase-vs-scaffold partitioning	IRAK4 (scaffold) · IRAK4 (kinase) · CRBN	Residual scaffold signaling limits kinase-only inhibition; degraders suppress NF-κB more deeply
Epithelial barrier setpoint	Tight junction · MUC2 · IRAK4/IKK	Inflammation-driven suppression of junctional/mucin programs
Myeloid malignancy stress dependency	IRAK4-L · spliceosome mutations	Survival signaling downstream of spliceosome-driven IRAK4 programs
Osteoimmune NF-κB coupling	RANK / RANKL · NF-κB	Inflammatory macrophage states converted to pro-osteoclastogenic signaling

Why modality is strategy: not only whether IRAK4 is inhibited, but whether its scaffold role is functionally addressed. [1]

> *"All these cytokines… you can find some paper to say it's up-regulated. You can build a story around whatever you want."*
>
> **— Kevin Kia, MD**[4]

09 · THE EVIDENCE GAP

Target engagement vs proof of position.

KT-474 Phase 1 in healthy volunteers showed mean blood IRAK4 reductions ≥93% after a single high dose and ≥95% after 14 daily doses at lower levels. In HS and AD patients, similar IRAK4 degradation was achieved in blood; IRAK4 was normalized in skin lesions; inflammatory biomarkers were reduced; no drug-related infections were reported. In open-label HS, KT-474 was associated with 46–51% reductions in abscess and nodule count, HiSCR50 of 42–50%, and 49–55% reductions in pain NRS.[14]

That is meaningful. But it is not the same as randomized, benchmark-clearing clinical proof. The KT-474 Phase 2 HS study was terminated, with no public randomized efficacy results posted.[15]

KNOWN	UNKNOWN	STRATEGIC IMPLICATION
IRAK4 is biologically plausible in HS	Magnitude of randomized clinical efficacy	Target remains live but not de-risked
KT-474 showed PBMC and skin target engagement	Whether engagement translates into benchmark-level HiSCR	PD is necessary, not sufficient
Open-label Phase 1 clinical activity observed	Durability and placebo-adjusted effect	Early signal does not define position
KT-474 Phase 2 was terminated before disclosed results	Whether issue was asset, design, sponsor or target	Target risk and asset risk remain unresolved
HS allows tissue sampling	Whether biomarker enrichment improves outcomes	HS remains a strong proving ground

CRITICAL GAP

No disclosed randomized HS efficacy dataset currently shows IRAK4 modulation can deliver benchmark-level clinical benefit. Until that changes, the opportunity remains plausible but not conviction-grade.

10 · CLINICIAN REALITY CHECK

What would actually change prescribing?

Mechanisms do not change practice unless they translate into a product profile clinicians can use. Shaikh's perspective is pragmatic: he sees the plausibility of innate immune involvement, including IL-1 and toll-like receptor biology, but does not treat pathway relevance as sufficient evidence of clinical utility.[3] For Kia, a new therapy needs to be either significantly more convenient — Skyrizi-style infrequent dosing — or significantly better, with effect sizes clearly impressive even without head-to-head data. He pushes the bar beyond HiSCR50 into HiSCR75, HiSCR90, and outcomes that address sinus drainage and sinus tracts.[4]

> *"Mechanistically there's a lot of plausibility there, but does that actually translate to clinical outcomes? I won't hold my breath, but I always welcome new things in the space."*
> **— Gibran Shaikh, MD[3]**

> *"Going beyond HiSCR50, looking at the HiSCR75 and 90s — seeing if you're pushing that envelope."*
> **— Kevin Kia, MD[4]**

> *"Structural things don't go away. Sinus tracts often don't go away — if you somehow are able to decrease that, that would be impressive."*
> **— Kevin Kia, MD[4]**

The next HS therapy does not need to be universally superior. It needs to be *clearly useful somewhere* — deeper response, less frequent dosing, cleaner safety, post-biologic use, biomarker-selected use, or meaningful impact on draining tunnels.

11 · PROOF OF POSITION

The decision framework for next-wave HS assets.

In benchmark space, a new therapy has to prove more than mechanism. It has to prove position. Proof of Position means demonstrating that a specific asset can earn a clinically meaningful, commercially relevant, and strategically defensible role in therapy.

01	**Benchmark clearance** Can the asset compete with current biologic and emerging oral standards on efficacy, durability, safety, convenience, and access?
02	**Depth of clinical value** Does it go beyond basic response thresholds into deeper outcomes — HiSCR75/90, pain, draining tunnels, sinus tracts, durability?
03	**Modality and mechanism advantage** Does the mechanism or modality solve a real clinical problem, or is it only an elegant biological story?
04	**Biomarker or patient-segment clarity** Can the program identify patients most likely to benefit, or does it rely on broad all-comer inflammation logic?
05	**Adoption and capital credibility** Is the evidence package strong enough to change prescribing, payer logic, partnership interest, or investment conviction?

12 · WHAT THE NEXT HS ASSET MUST SHOW

Not everything to everyone — but unmistakably useful somewhere.

For a JAK inhibitor, that may mean efficacy strong enough to overcome black-box-warning friction. For an IL-17A/F agent, the question is whether it can stand out in an increasingly crowded class. For an IL-1-family therapy, whether upstream biology becomes clinically visible. For IRAK4, whether degrader or scaffold-aware biology can outperform the cautionary signal from kinase-only inhibition.[1,4,8,10,11,12,14]

DIMENSION	MINIMUM BAR	DIFFERENTIATED BAR
HiSCR50	Clearly above placebo	Directionally competitive with current benchmarks
Deeper response	HiSCR75/90 supportive	Strong HiSCR75/90; clinically visible depth
Tunnels / sinus tracts	Reduced drainage	Meaningful effect on draining tunnels or sinus-tract burden
Durability	Maintained 24–48 weeks	Durable response beyond induction
Safety	Acceptable for chronic use	Clean enough for earlier-line positioning
Convenience	Oral or manageable injectable	Meaningfully lower burden without efficacy trade-off
Biomarker / segment	Plausible subgroup logic	Prospective enrichment or phenotype-led use
Positioning	Plausible role	Clearly useful somewhere in the pathway

> *"You'll need a pretty benign safety profile to come on as a first- or second-line treatment. Otherwise, it's coming in as third-line."*
>
> **— Kevin Kia, MD[4]**

13 · BIOMARKER STRATEGY

Promising, necessary, not yet operational.

For IRAK4 and the wider IL-1/TLR–IRAK4 axis, biomarker enrichment may be one of the most credible ways to translate broad inflammatory biology into a differentiated clinical-development strategy.[1,2] IL-36 sits directly upstream of IRAK4/MyD88 signaling and is scored as a WATCH 3.3/5 stratification axis.[1]

> *"No, it's certainly not happening at the moment… we're still way more in the stone ages than I think we sometimes care to admit."*
>
> **— Gibran Shaikh, MD[3]**

> *"The beauty of skin is that it's very accessible — it's pretty easy to take a 4-millimetre punch and send it for RNA-seq."*
>
> **— Gibran Shaikh, MD[3]**

14 · STRATEGIC IMPLICATIONS

The next chapter should be written as an evidence agenda.

For pharma, the implication is clear: do not pursue a next-wave HS asset on biology alone. Build a benchmark-aware target product profile from the start. Define whether the asset is intended to win through deeper efficacy, lower treatment burden, a cleaner safety profile, post-biologic use, earlier-line use, biomarker enrichment, or a specific phenotype such as draining tunnels.

For consultants, the value is no longer in writing mechanism narratives. It is in helping clients understand category structure, benchmark pressure, evidence architecture, and adoption logic.

For investors, the lesson is capital discipline. Underwrite on evidence that changes conviction: depth of response, safety, trial signal quality, biomarker strategy, modality differentiation, and clarity of clinical use.

For Techspert, this is exactly where primary research matters. Secondary data can show what has been published. Expert research shows how that evidence is interpreted.

AUDIENCE	FOCUS ON	AVOID	MUST-ANSWER QUESTION
Pharma	Benchmark-aware TPP, enriched PoC, phenotype-specific value	Biology-only rationale	Where does this asset fit?
Consultants	Category positioning and evidence architecture	Generic unmet-need narrative	What proof changes the client decision?
Investors	Signal quality, modality, safety, target-vs-asset risk	Pathway centrality alone	What result justifies capital?

Evidence agenda — six steps

01	**Benchmark explicitly** Interpret new data against current biologic and oral standards, not only placebo.
02	**Go deeper than HiSCR50** Track HiSCR75, HiSCR90, pain, draining tunnels, sinus-tract impact, durability.
03	**Clarify safety position** Define whether the asset is realistic for first-, second- or third-line use.
04	**Separate target from asset risk** Do not overread ambiguous outcomes as either class failure or class validation.
05	**Make biomarker strategy operational** Move from retrospective explanation to prospective enrichment.
06	**Define the treatment role before the next trial** A trial should ask not only whether the asset works — but where it belongs.

FINAL HERO STATEMENT

In HS, the next wave of therapies no longer needs to prove that the biology makes sense. It needs to prove that the product has a place.

15 · ABOUT TECHSPERT & METHODOLOGY

Primary research for life-sciences decision-making.

Techspert is a primary research platform built for life-sciences decision-making. We help biopharma, consulting, investment, and healthcare organizations access highly relevant expert insight across clinical, scientific, commercial, and market-access questions — moving beyond secondary data to test what matters with the people closest to the market.

For complex areas such as immunology, dermatology, oncology, rare disease, and emerging modalities, Techspert helps clients answer the questions that conventional datasets cannot: how clinicians interpret new evidence, what changes prescribing behavior, where unmet need persists despite new launches, and what proof points would change stakeholder conviction.

Methodology — four evidence streams

1. Primary expert interviews with dermatology clinicians on real-world HS treatment, benchmark therapies, prescribing considerations, and biomarker feasibility.

2. IRAK4 landscape analysis — ecosystem-level assessment of maturity, momentum, competition, modalities, control axes, patents, deals and investors.

3. HS-specific IRAK4 indication analysis — pathway rationale, modality-shift logic, KT-474 / KT-485 context, evidence gaps, biomarker-enriched PoC recommendations.

4. Public clinical and market evidence on approved biologics, oral / small-molecule assets, IL-1, IL-17A/F competitors, IRAK4 degradation, and HS disease burden.

Landscape data and analytical inputs supplied by Intangia. Final narrative framing, expert synthesis, and market interpretation by Techspert. The ecosystem data powering this report was built on Intangia's platform.

REFERENCES

Sources & evidence base

1	**Intangia**	IRAK4 landscape data, 2026 — maturity, momentum, competition, modality, control-axis and indication scoring.
2	**Techspert / Intangia**	HS-specific IRAK4 indication analysis — pathway rationale, lesional vs non-lesional expression, modality-shift logic.
3	**Techspert primary research**	Interview with Gibran Shaikh, MD — dermatology KOL, HS treatment landscape and biomarker feasibility.
4	**Techspert primary research**	Interview with Kevin Kia, MD — dermatology KOL, HS prescribing reality, JAK safety, benchmark expectations.
5	**NEJM**	Kimball AB et al. PIONEER I and II — adalimumab in moderate-to-severe HS. N Engl J Med 2016;375:422–434.
6	**Lancet**	Kimball AB et al. SUNSHINE & SUNRISE — secukinumab in moderate-to-severe HS, Phase 3 RCTs. Lancet 2023;401:747–761.
7	**Novartis / FDA**	Cosentyx (secukinumab) label expansion — pediatric HS approval, patients ≥12 years.
8	**Lancet**	Kimball AB et al. BE HEARD I & II — bimekizumab in moderate-to-severe HS, Phase 3 RCTs. Lancet 2024;403:2504–2519.
9	**Incyte**	STOP-HS Phase 3 (povorcitinib) — 54-week efficacy and safety in HS; HiSCR50/75/100 and lesion clearance readouts.
10	**Pfizer**	Phase 2a HS readouts — brepocitinib (JAK1/TYK2), ropsacitinib (TYK2), zimlovisertib (IRAK4 kinase) vs placebo at Week 16.
11	**JAMA Dermatology / AbbVie**	Lutikizumab Phase 2 in HS — dual IL-1α/IL-1β antagonist, anti-TNF inadequate responders.
12	**MoonLake Immunotherapeutics**	Sonelokimab VELA Phase 3 — IL-17A/F Nanobody, HiSCR75 primary endpoint readouts.
13	**Avalo Therapeutics**	Abdakibart / AVTX-009 LOTUS Phase 2 — anti-IL-1β antibody, HS topline at Week 16.
14	**Nature Medicine / Kymera**	KT-474 (zabedosertib) Phase 1 — first-in-human IRAK4 degrader; PD in HV, HS and AD; lesional IRAK4 normalization.
15	**ClinicalTrials.gov**	NCT06028230 — KT-474 Phase 2 in HS (terminated); no public randomized efficacy results.
16	**ClinicalTrials.gov**	Public trial registry data supporting cross-asset HS development status.

Cross-trial comparisons throughout this report are directional only; endpoints, populations and timing vary across studies. Quotes are drawn from Techspert primary research interviews and reproduced with consent.