Dr. Andrew Willoughby

Ascenda Scientific Advisory Board Member

Profile Considerations

- Chronological Age: 65
- Biological Age (DNA Methylation): 39.9
- Height: 5’11” (181 cm)
- Weight: 182.5 lbs (85.1 kg)
- VO_2 Max: 53.4 ml/kg/min
- Grip Strength: RH 166 lbs | LH 165 lbs
- Breath Hold: 2:03 seconds
- BOLT Score: Breath Exhale Hold 49 secs
- Training: 6 days/week

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- Zone 2 cardiovascular conditioning
- Plyometrics
- Heavy resistance training

Nutrition/Metabolic Support Strategy:

- 18:6 daily intermittent fasting
- Monthly 4–6 day water-only fasts
- Comprehensive antioxidant supplementation (128 capsule protocol)
- HD Shilajit Oil
- Haskap berry polyphenol concentrate
- NanoMetallic Silver Oxide liquid support
- Two antioxidant meal replacement shakes daily
- IV AutoHemoTherapy with NMSTTO & AOs

Monitoring:

- Quarterly biomarker panels (blood, urine, stool)
- Oral DNA PCR analysis
- DNA methylation (CpG island analysis)
- Advanced metabolic tracking

Clinical Status:

- No comorbidities
- Metabolically efficient
- High physiological resilience

Phase I

Metabolic & Mitochondrial Terrain Optimization (Weeks 1–6)

Objective

Prepare cellular and metabolic terrain before regenerative or anabolic expansion.

Functional Emphasis

- Mitochondrial membrane stabilization
- AMPK activation
- NAD^+ pathway support
- Insulin sensitivity enhancement
- Fat oxidation and metabolic flexibility
- Inflammatory load reduction

System Role

This phase improves ATP production, increases oxidative fiber utilization, enhances metabolic efficiency, and reduces systemic strain on aging mitochondria.
It establishes optimal terrain for downstream regenerative and anabolic signaling.

Primary Research Compounds

- SS-31 (Elamipretide)
- MOTS-C
- Retatrutide
- 5-Amino-1MQ
- SLUPP-32X (SLU-PP-322)
- KPV

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Phase II

Regenerative & Epigenetic Expansion (Weeks 7–12)

Objective

Capitalize on optimized metabolic terrain to enhance tissue integrity, immune architecture, and aging biology.

Functional Emphasis

- Connective tissue repair
- Angiogenesis and regeneration
- Thymic modulation
- Telomere signaling support
- Circadian regulation
- Neuro-mitochondrial enhancement
- Collagen and extracellular matrix integrity

System Role

This phase supports structural repair, immune modulation, neural mitochondrial performance, and epigenetic signaling relevant to longevity.

It enhances recovery, sleep architecture, skin integrity, and neurocognitive resilience.

Primary Research Compounds

- BPC-157
- TB-500 (Thymosin Beta-4)
- Thymalin
- Epithalon
- GHK-Cu
- Pinealon

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Phase III

Anabolic & Performance Amplification (Weeks 13–18)

Objective

Strategically enhance muscle architecture, GH-axis signaling, and endocrine performance following metabolic and regenerative preparation.

Functional Emphasis

- Myostatin modulation
- GH pulse optimization
- IGF pathway modulation
- Lean mass expansion
- Androgen restoration
- Recovery amplification

Structural Note

Growth hormone secretagogues are rotated rather than stacked simultaneously to preserve receptor sensitivity and prevent chronic overstimulation.

Anabolic signaling is implemented in a controlled, time-bound manner to protect metabolic integrity.

Primary Research Compounds

- Follistatin (time-limited cycle)
- IGF-1 LR3 (pulsed use)
- CJC-1295 DAC
- Ipamorelin (rotational)
- Hexarelin (short-cycle rotational use)
- Testosterone Cypionate
- AOD-9604

- Testosterone Cypionate not shown.

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Phase IV

Consolidation & Maintenance (Weeks 19–22)

Objective

Preserve gains, reduce inflammatory rebound, and maintain mitochondrial stability.

Functional Emphasis

- Connective tissue integrity
- Mitochondrial preservation
- Immune modulation
- Anti-inflammatory support
- Skin and ECM maintenance

System Role

This phase supports structural repair, immune modulation, neural mitochondrial performance, and epigenetic signaling relevant to longevity.

It enhances recovery, sleep architecture, skin integrity, and neurocognitive resilience.

Primary Research Compounds

- GHK-Cu
- KPV
- Low-frequency SS-31
- Thymalin pulse (if indicated)

This phase consolidates adaptations and stabilizes systemic improvements.

Growth Hormone & Endocrine Axis Integration

Testosterone Cypionate is integrated strategically across anabolic phases to support:

- Muscle protein synthesis
- Oxygen delivery and red blood cell mass
- Bone density
- Cognitive clarity
- Sleep quality

GH-axis compounds are used with rotation logic to preserve endocrine balance and long-term responsiveness.

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NanoMatrix™ Integration Platform

Within MEOP v2.0, all peptides are reconstituted using Ascenda NanoMatrix™ to standardize preparation and preserve structural integrity.

NanoMatrix™ functions as:

- A nano-stabilized reconstitution platform
- A molecular integrity amplifier
- An antimicrobial safeguard during storage and handling
- A tissue-supportive environment at administration sites
- A degradation-reduction system
- A protocol-wide consistency stabilizer

NanoMatrix™ acts as the connective platform across mitochondrial, regenerative, endocrine, and longevity research axes.

Biomarker-Guided Adaptation

MEOP v2.0 is biomarker-responsive. Key monitoring domains include:

- Fasting insulin & HOMA-IR
- IGF-1
- hs-CRP
- ApoB & lipid profile
- SHBG
- RBC count & hematocrit
- VO_2 Max
- DNA methylation age
- Inflammatory markers
- Hormonal panels

Protocol modulation is informed by objective biomarker data rather than static implementation.

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Architectural Philosophy

MEOP v2.0 is not a stack.

It is a structured longevity architecture.

It emphasizes:

- Periodization over chronic stimulation
- Terrain optimization before amplification
- Receptor preservation
- Mitochondrial-first strategy
- Inflammatory load control
- Biomarker-guided refinement

The objective is not short-term performance — but sustained physiological resilience.

Final Statement

Dr. Andrew Willoughby's MEOP v2.0 reflects a disciplined, data-driven, multi-axis approach to longevity research.

It integrates mitochondrial optimization, metabolic regulation, regenerative signaling, epigenetic modulation, endocrine support, and structured anabolic expansion — all unified by NanoMatrix™ as a stability and consistency platform.

This architecture is designed for experienced, biomarker-aware researchers operating at an advanced level of physiological optimization.

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