

POLICY PROPOSAL: EMERGENT THREAT WORKING GROUP (ETWG)

A Proactive Framework for Assessing and Mitigating Converging Technological Risks

EXECUTIVE SUMMARY

This proposal establishes the Emergent Threat Working Group (ETWG), a cross-disciplinary body designed to monitor, assess, and develop governance frameworks for rapidly converging bio-digital technologies. The ETWG will serve as a proactive entity addressing unprecedented risks arising from the integration of biotechnology, nanotechnology, artificial intelligence, and advanced communications infrastructure. With mandates for research coordination, policy development, and public engagement, the ETWG will bridge critical gaps between technological advancement and ethical governance to ensure that emergent technologies enhance rather than compromise human autonomy, security, and wellbeing.

BACKGROUND AND JUSTIFICATION

Current Landscape Assessment

Recent technological advances have accelerated the convergence of previously distinct domains including genomics, nanotechnology, artificial intelligence, and telecommunications infrastructure. This convergence creates novel capabilities with profound implications for individual rights, national security, and social cohesion. Specifically:

- 1. Bio-Digital Convergence:** The integration of biological systems with digital technologies has progressed from theoretical to

deployable, as evidenced by developments in mRNA delivery systems, biocompatible nanomaterials, and the Internet of Bio-Nano Things (IoBNT).

- 2. Surveillance Capabilities:** Advanced biosensors, remote sensing technologies, and high-resolution biometric monitoring systems have evolved beyond conventional data collection, enabling persistent emotional, cognitive, and physiological surveillance.
- 3. Regulatory Gaps:** Current governance frameworks remain fragmented across multiple jurisdictions and regulatory bodies, creating significant oversight gaps for technologies that transcend traditional definitional boundaries.
- 4. Global Standardization Acceleration:** International bodies including the IEEE, ITU, and IEC are rapidly developing technical standards for bio-digital technologies with minimal public input or ethical oversight.

MISSION AND OBJECTIVES

The ETWG is established with the following mission: to develop comprehensive, adaptive, and ethically-grounded governance frameworks for converging bio-digital technologies that prioritize human dignity, autonomy, and security while enabling beneficial innovation.

Primary Objectives:

1. Establish continuous monitoring protocols for high-risk technological convergence areas

2. Develop risk assessment methodologies specifically tailored to bio-digital threats
3. Coordinate cross-jurisdictional policy responses and harmonized regulatory approaches
4. Ensure meaningful public engagement and democratic oversight of emerging governance frameworks
5. Facilitate responsible innovation pathways that respect fundamental rights and liberties

SCOPE AND PRIORITY DOMAINS

The ETWG will focus on twelve critical domains representing the highest-risk areas of bio- digital convergence:

1. Persistent Biologics & Programmable Medicine

- mRNA delivery systems and spike protein persistence
- Programmable cellular reprogramming technologies
- Remote genetic modulation systems (radiogenetics/optogenetics)
- Enzymatic countermeasures and persistence mitigation

2. Advanced Biosurveillance & Tracking Systems

- Miniaturized CMOS-based ingestible sensors
- Fluorescent and luciferase-based biosensors
- Label-free detection systems
- Integration of biosurveillance with mainstream infrastructure

3. Internet of Bio-Nano Things (IoBNT)

- IEEE 1906.1 molecular communication standards
- Bio-nano routing protocols (e.g., CORONA systems)
- Plasmonic nano-DNA antennas
- Intra-body network architecture implementation

4. 6G Integration & Wireless Body Area Networks

- IEEE 802.15.6 WBAN implementation and security
- Remote emotion and cognitive state recognition
- THz frequency biosensing systems
- Visible light communication for intrabody transmission

5. Neural Surveillance & Cognitive Monitoring

- Non-invasive brain-computer interfaces
- DARPA N3 and related neural technologies
- Remote emotion detection and classification systems
- NeuroPhone and similar thought-to-device interfaces

6. Bio-Digital Identity & Governance Systems

- Genetic authentication infrastructure
- Biobanking-as-a-service platforms
- Biometric integration with digital currency and access systems
- Predictive behavioral scoring and biological compliance systems

7. Smart City Biometric Integration

- Ambient biosensing in public infrastructure
- Multi-modal surveillance integration
- Healthcare monitoring in urban environments
- Nano-enabled environmental monitoring

8. Human Energy Harvesting & Bio-Power

- Triboelectric nano-generators for body-powered devices
- WBAN energy harvesting technologies
- Human body as communication medium and power source
- Nano-grid integration with biological systems

9. Weaponized Bio-Nano Systems

- Dual-use biosensing platforms
- Repurposed biomedical tools for surveillance
- Militarized synthetic biology applications
- Bio-cyber attack vectors and countermeasures

10. Synthetic Biological Intelligence

- Neurohybrid computing systems
- Biological neural networks interfacing with digital systems
- Organoid-based computing and sensing platforms
- AI-biological feedback systems

11. Global Standards & Harmonization

- Analysis of ITU IMT-2030 framework implications
- IEC standardization for bio-digital convergence
- IEEE 1906.1 policy development
- Cross-border biodata governance frameworks

12. Consumer Integration & Commercial Applications

- Nanotechnology in food and beverage products
- Cosmetic and pharmaceutical nano-delivery systems
- Consumer goods with embedded biosensing capabilities
- Commercial biodata monetization models

ORGANIZATIONAL STRUCTURE

The ETWG will operate as an independent body with a multi-stakeholder governance structure:

Core Components:

1. **Executive Steering Committee:** Comprised of 15 members representing:
 - Government agencies (Health, Defense, Commerce, Science)
 - Civil society organizations
 - Academic research institutions
 - Industry representatives
 - Ethics and human rights experts

- 2. Technical Assessment Panels:** Twelve domain-specific expert panels corresponding to the priority domains, each with 7-9 specialists
- 3. Interdisciplinary Analysis Unit:** Permanent staff dedicated to cross-domain threat analysis and horizon scanning
- 4. Ethics and Rights Council:** Independent advisory body ensuring all assessments and recommendations comply with human rights frameworks
- 5. Public Engagement Division:** Responsible for transparency, education, and participatory governance mechanisms

METHODOLOGICAL FRAMEWORK

The ETWG will employ a structured approach to threat assessment and mitigation:

1. Threat Identification Process Phase 1: Initial Detection

- Continuous scanning of scientific literature and patent filings
- Monitoring of technical standards development
- Analysis of venture capital flows and commercialization pathways

CONCEPT: ABRAXAS HUDSON

- Tracking of national security research programs (e.g., DARPA)

Phase 2: Preliminary Assessment

- Technical feasibility evaluation
- Dual-use potential analysis
- Proliferation risk assessment
- Categorization within convergence framework

Phase 3: Comprehensive Analysis

- Full threat characterization
- Vulnerability assessment
- Impact projection (short, medium, long-term)
- Identification of critical control points

2. Risk Evaluation Metrics

The ETWG will employ a multi-dimensional risk assessment framework addressing:

- **Technical Dimensions:** State of development, scalability, accessibility
- **Impact Dimensions:** Magnitude, persistence, reversibility, scope

- **Governance Dimensions:** Regulatory coverage, jurisdictional gaps, enforcement challenges
 - **Ethical Dimensions:** Autonomy implications, justice considerations, potential for misuse
 - **Societal Dimensions:** Public awareness, distributional effects, power relationships
- 3. Response Development Protocol**
For each identified high-priority threat, the ETWG will develop:

- Immediate mitigation recommendations
 - Medium-term regulatory proposals
 - Long-term research and governance frameworks
 - International coordination requirements
 - Public communication strategies
- IMPLEMENTATION TIMELINE Phase 1: Establishment (Months 1-6)**
- Formation of Executive Steering Committee
 - Recruitment of technical and policy staff

CONCEPT: ABRAXAS HUDSON

- Development of operational protocols
- Initial scanning of priority domains
Phase 2: Initial Assessment (Months 7-12)
- Comprehensive baseline assessment of all priority domains
- Establishment of monitoring systems
- Development of interdisciplinary analysis methodologies
- Initial stakeholder engagement
Phase 3: Operational Capacity (Months 13-24)
- Full implementation of continuous monitoring systems
- Publication of domain-specific assessment reports
- Development of policy recommendation frameworks
- Establishment of international coordination mechanisms
Phase 4: Full Implementation (Months 25+)
- Regular threat assessment publications
- Dynamic response to emerging threats

- Ongoing refinement of methodologies
- International harmonization of approach
SPECIFIC INITIATIVES AND ACTIONS 1. Monitoring and Research Initiatives BioDigital Convergence Observatory
- Continuous monitoring of scientific literature, patents, and commercial developments
- Quarterly trend reports on convergence acceleration
- Open database of technological developments and implications
Interdisciplinary Research Program
- Funding for cross-disciplinary risk assessment methodologies
- Development of technical testing protocols for bio-digital systems
- Research on countermeasures and safeguards
Standards Review Mechanism
- Real-time analysis of emerging technical standards
- Assessment of governance implications
- Development of rights-protective alternative standards
2. Policy Development Initiatives Regulatory Gap Analysis Project

- Comprehensive mapping of jurisdictional boundaries
- Identification of statutory and regulatory gaps
- Development of model legislation for critical areas

Harmonized Governance Framework

- Creation of cross-border governance principles
- Coordination of international regulatory approaches
- Mechanisms for addressing global commons issues

Rights-Protection Protocols

- Development of neuro-rights frameworks
- Genetic data governance principles
- Biometric data protection standards

3. Public Engagement Initiatives Informed Consent Initiative

- Development of meaningful consent mechanisms for bio-digital technologies
- Educational resources on implications of emerging systems

CONCEPT: ABRAXAS HUDSON

- Consumer rights frameworks specific to bio-digital products
Participatory Governance Platform

- Public consultation mechanisms for standards development

- Citizen juries for ethical assessment

- Transparent decision-making processes
Educational Outreach Program

- Materials for educational institutions at all levels

- Professional development for policymakers

- Public awareness campaigns on key issues
RESOURCE REQUIREMENTS Staffing Requirements
Core Staff

- Executive Director and administrative team (7 FTE)

- Technical Assessment Directors (12 FTE, one per domain)

- Interdisciplinary Analysts (24 FTE)

- Policy Development Specialists (15 FTE)

CONCEPT: ABRAXAS HUDSON

- Public Engagement Officers (10 FTE)
Extended Network
- Technical Assessment Panel Members (84-108 part-time specialists)
- Ethics and Rights Council (15 part-time members)
- International Liaison Network (24 part-time coordinators)
Budget Framework Annual Operating Budget
- Personnel: \$14-18 million
- Research grants: \$25-30 million
- Operations and infrastructure: \$8-10 million
- Public engagement: \$5-7 million
- International coordination: \$3-5 million
- Total annual budget: \$55-70 million
Five-Year Implementation Budget
- Year 1: \$35 million (establishment focus)
- Year 2: \$50 million (capacity building)

- Year 3: \$60 million (full operations)
- Years 4-5: \$65-70 million (program expansion)
- Total five-year budget: \$275-285 million

EVALUATION AND ACCOUNTABILITY Performance Metrics

The ETWG will be evaluated based on:

1. Threat Assessment Quality

- Accuracy of technology projections
- Timeliness of identification
- Comprehensiveness of analysis

2. Policy Impact

- Adoption rate of recommendations
- Regulatory gaps addressed
- Standards influence achieved

3. Public Engagement Effectiveness

- Stakeholder diversity
- Knowledge dissemination metrics
- Public trust indicators

Oversight Mechanisms

1. Independent Review Board

- Annual performance assessment
- Methodology validation

2. Public Accountability

Reports

- Quarterly public briefings
- Annual comprehensive reports
- Open data on activities and findings

3. **Sunset Review Process**

- Comprehensive review after 5 years
- Assessment of continued necessity
- Structural optimization recommendations

ANTICIPATED CHALLENGES AND MITIGATION STRATEGIES

1. **Industry Resistance**

- **Challenge:** Opposition from sectors benefiting from regulatory gaps
- **Mitigation:** Proactive industry engagement, incentive structures for responsible

innovation, public pressure through transparency 2. **Jurisdictional Complexity**

- **Challenge:** Overlapping authorities and regulatory fragmentation
- **Mitigation:** Formal coordination mechanisms, harmonized definitions, model

legislation with jurisdictional adaptability 3. **Technical Expertise Gaps**

- **Challenge:** Shortage of specialists in rapidly emerging fields
- **Mitigation:** Training programs, academic partnerships, knowledge transfer

mechanisms

4. **Political Polarization**

- **Challenge:** Partisan approaches to governance of sensitive technologies
- **Mitigation:** Evidence-based assessments, inclusive stakeholder engagement,

focus on shared values 5. **Rapid Technology Evolution**

- **Challenge:** Assessment frameworks becoming obsolete
- **Mitigation:** Adaptive governance principles, continuous methodology refinement,

focus on underlying trends rather than specific technologies

CONCLUSION AND CALL TO ACTION

The convergence of biological, digital, and nanotechnologies presents unprecedented governance challenges that cannot be adequately addressed through existing regulatory structures. The Emergent Threat Working Group represents a necessary evolution in our approach to technological governance—one that matches the complexity, speed, and cross-domain nature of the systems it aims to address.

By establishing the ETWG, we can ensure that transformative technologies enhance rather than undermine human flourishing, security, and autonomy. The window for establishing effective governance is narrowing as technological convergence accelerates. This proposal calls for

immediate action to implement the ETWG framework and begin the essential work of developing adaptive, ethical governance for our shared bio-digital future.

APPENDICES

Appendix A: Detailed Domain Risk Assessments

Comprehensive analysis of current threat landscapes across all twelve priority domains

Appendix B: Stakeholder Mapping

Identification of key entities in government, industry, civil society, and academia for engagement

Appendix C: Comparative International Approaches

Analysis of existing governance frameworks and their effectiveness

Appendix D: Technical Standards Landscape

Detailed mapping of relevant standards bodies and their current work programs

Appendix E: Methodological Details

CONCEPT: ABRAXAS HUDSON

In-depth description of risk assessment methodologies and analytical frameworks