DNA Data Storage Alliance

2024 Review and 2025 Plans

Presented by Dave Landsman (dave.landsman@wdc.com)

DNA Data Storage Alliance

40+ member organizations

Mission

- Create an interoperable storage ecosystem based on DNA as a data storage and compute medium

Scope

- Educate the market to create awareness and adoption of DNA data storage and compute
- Influence and drive R&D and funding
- Develop standards and specifications to encourage ecosystem evolution

SNIA

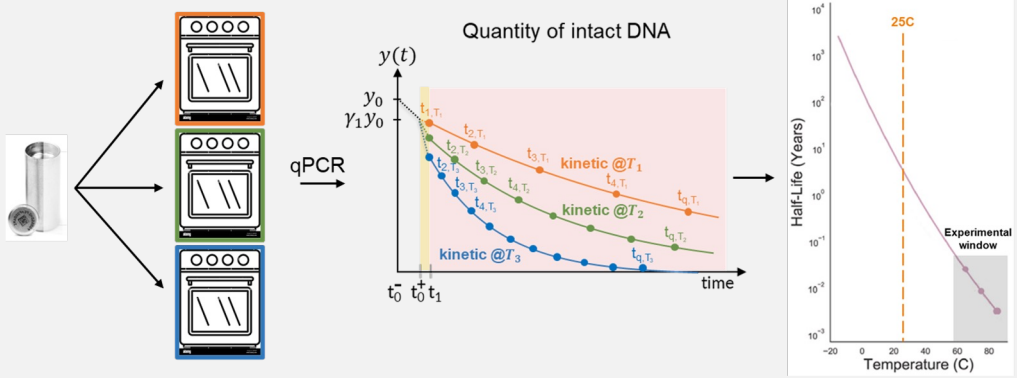
DNA Data Storage Alliance - 2024 Accomplishments

- Specs and Publications
  - Alliance's 2nd specification: DNA Stability Evaluation Method for DNA Data Storage Containment Systems v1.0
  - Chapter on DNA data storage: IEEE Mass Storage Roadmap Update
- Presentations
  - FMS
    - DNA Data Storage – Landsman (slides)
    - End-to-End DNA Data Storage System Concept – Lauvray/Shruti/Landsman (slides)
  - SDC
    - End-to-End DNA Data Storage System Concept – Lauvray/Shruti (video)
  - Storage Technology Showcase
    - DNA Data Storage Alliance Overview – Landsman
    - DNA Data Storage Alliance Technical Roadmap - Hoffman
  - Library of Congress Designing Storage Architectures Forum
    - Data Retention Metrics in a DNA Storage System – Landsman, et al
  - Other
    - Podcast (SNIA Experts on Data): DNA, The Future of Data Storage – Singer/Landsman (video)
    - Monthly all member meetings

SNIA

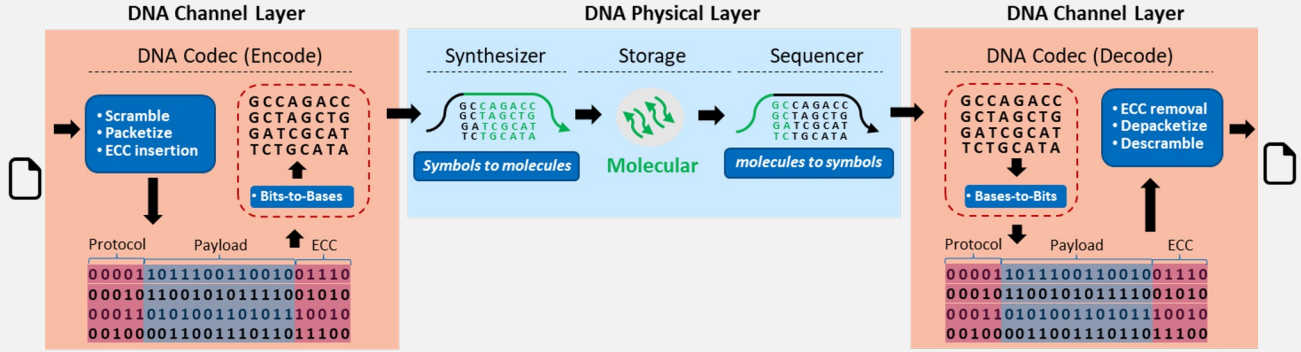
DNA Data Storage Alliance - 2024 Accomplishments (2)

1) Data Retention TWG Subgroup



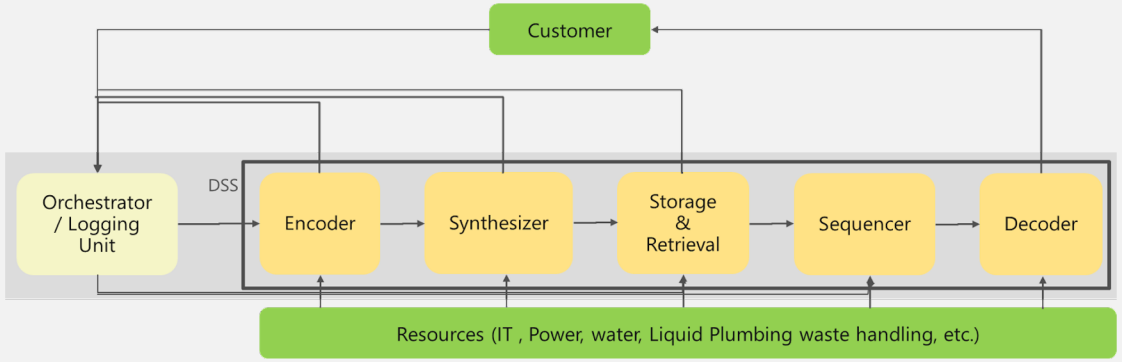
- **V1.0 Published**

2) Codecs TWG Subgroup



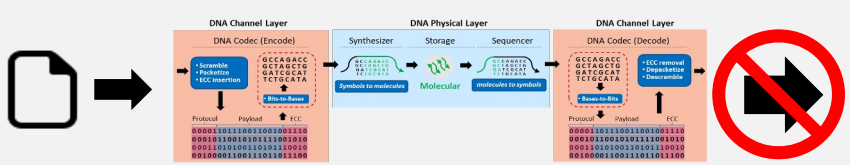
- **Working on "Codec Requirements" spec integration**
- **Open source codec TBD**

3) Interoperable Interfaces TWG Subgroup



- **Working on spec integration**

4) Biosecurity Task Force



- Develop Alliance position and engage regulators to avoid over-regulation based on misconceptions

- **Evaluating "mathematical proof" vs. "vendor trust" model**

SNIA

DNA Data Storage Alliance - 2024 Accomplishments (3)

- Satellite workshop at ISIT 2024: Coding Theory and Algorithms for DNA-based Data Storage
- Topics of Interest
  - Sequence reconstruction and codes correcting edit errors
  - Emerging sequencing technologies
  - Coding for native DNA-based data storage systems
  - Information aspects of high throughput synthetic biology
  - Machine learning approaches for data reconstruction in DNA-based storage systems
- Confirmed Speakers
  - Daniel Bedau (Western Digital)
  - James Diggans (Twist Bioscience)
  - Robert Grass (ETH Zurich)
  - Olgica Milenkovic (University of Illinois Urbana-Champaign)
  - Zohar Yakhini (Technion / Reichman University)

SNIA

DNA Data Storage Alliance – 2025 Plans

- Events
  - Storage and Computing with DNA 2025, Paris, June 19-21
- Finish ongoing work
  - Technology Roadmap/Whitepaper
  - Codec Requirements
  - End-to-End Interoperable Interfaces
- New work
  - Biosecurity: At least a position on regulatory scope (not overreach) needed for DNA data storage
  - Data retention: Calculator for what is “enough” DNA left to guarantee data recovery?
  - Coding: Characterizing solid state nanopore channel
  - Archive self-discovery: Alternative to Rosetta

SNIA

Why get involved?

- Industry Impact
  - First alliance in this new field; shaping industry as it's being built
- Segment Relevance
  - The storage hierarchy needs a new layer for zettabyte scale storage
- Why join?
  - Multi-disciplinary field requiring experts from software, storage, hardware, biotech and more
  - Opportunity to be part of a birth of a new technology for archival storage
- Contacts
  - Dave Landsman (dave.landsman@wdc.com)
  - Esther Singer (esinger@twistbioscience.com)

SNIA

DNA Data Storage Alliance

- Board
  - Dave Landsman – Western Digital (co-chair)
  - Esther Singer – Twist Bioscience (co-chair)
  - Stephane Lemaire – Biomemory
  - Marthe Colotte – Imagene
  - Julien Muzard – Entegris
- TWG Chairs
  - Dave Landsman and Esther Singer
- TWG Subgroup, Taskforce, SIG Chairs
  - Dave Landsman – Data Retention
  - Manish Gupta – Codecs
  - Shruti Sethi – Interoperable Interfaces
  - Esther Singer & David Turek – Biosecurity
  - John Hoffman - Roadmap

SNIA