

CryptoMol™

The layer a counterfeiter cannot reach.

Cryptographic molecules are embedded in the ink of every **QAuthR™** code. They are invisible, they carry the key that encrypts the code, and they cannot be reproduced — even by Iridia.

WHAT CRYPTOMOL IS

Forensic-grade proof that an object is authentic.

A printed mark can be photographed. A database can be breached.

CryptoMol sits inside the ink itself: a Molecular Data Polymer, sealed in a silica sphere 100nm across, readable only in a laboratory and only from the physical item. It is the layer that settles a dispute.

HOW IT WORKS

Four molecular facts

01 Embedded in the ink

QAuthR codes are printed with inks that have cryptographic molecules embedded into them. The same inks are supplied as Secure Paint Pens and Secure Stamps, and the molecules also go into paints, coatings and 3D-printed parts.

02 Encapsulated in silica

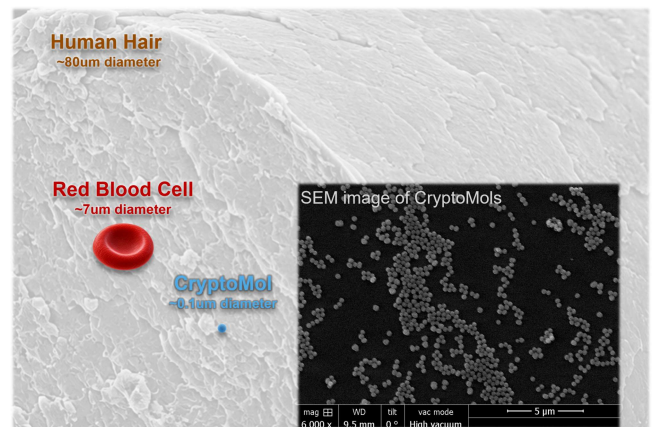
The molecules are encapsulated in tiny silica spheres, 100nm across. The shell protects the Molecular Data Polymer so the data lasts.

03 A Molecular Data Polymer

Buried deep in that silica sphere is a Molecular Data Polymer that has been developed, ruggedized, and scaled to production.

04 Impossible to reproduce

The molecules cannot be reproduced, even by Iridia.



Scale under SEM — human hair (~80µm), red blood cell (~7µm), **CryptoMol** (~0.1µm).

VERIFICATION

The molecules are what get checked

1 In the field

Any phone reads the **QAuthR** code printed in **CryptoMol** ink. No custom hardware, no proprietary reader.

2 Bound to the object

The code decrypts only against the key its **CryptoMol** molecules carry. Copy the artwork or breach the database and it still fails.

3 In the lab

When a claim is contested, swab or mail the item. Iridia reads the **CryptoMol** layer itself and returns a forensic result.

✓ Forensic-grade proof, embedded in the ink. Nothing to photograph, nothing to reverse-engineer, nothing worth stealing.

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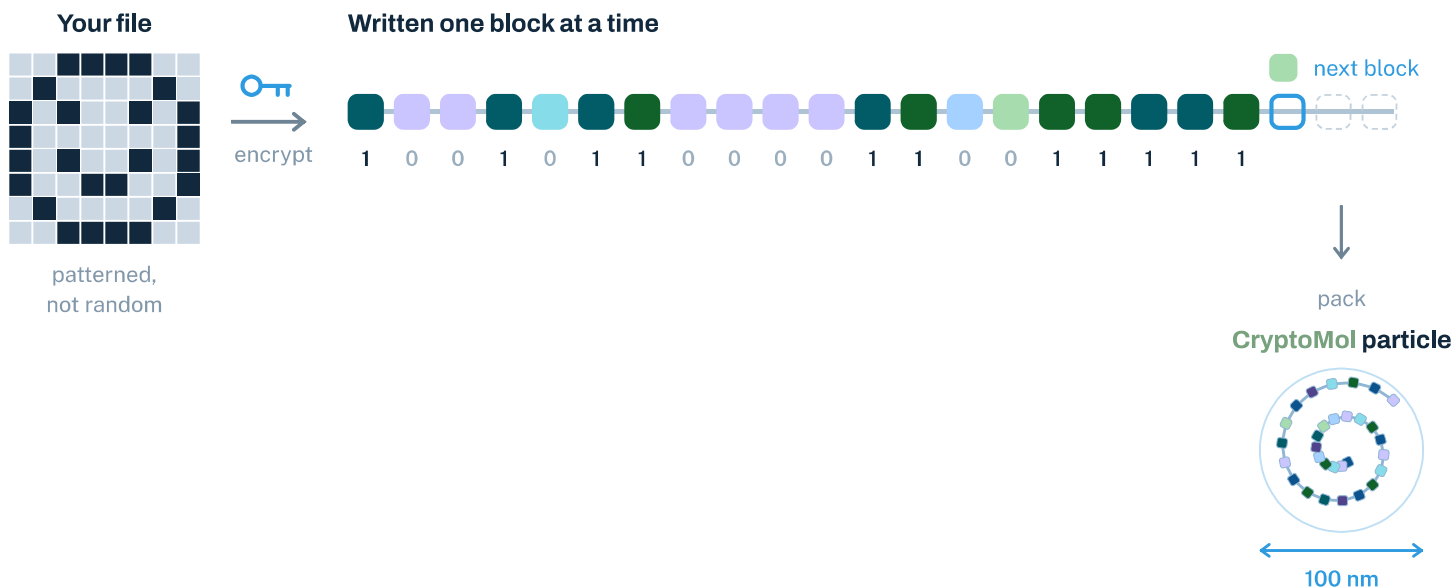
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How a file becomes a molecule.

Your data is encrypted, written one block at a time into a Molecular Data Polymer, then packed into a particle 100 nanometers across.



Eight blocks,
one bit each

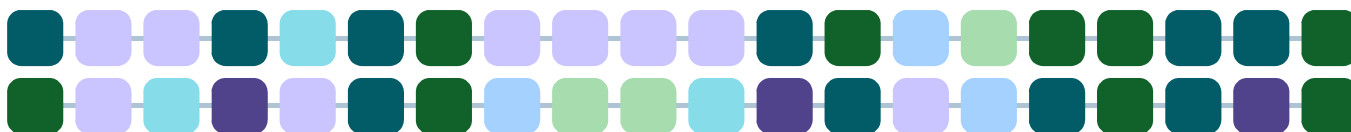


any of these writes a 0



any of these writes a 1

The same file, written twice



Same bits. Different molecule every time.

Light blocks write a 0, dark blocks write a 1 — one bit per block. Which of the four light blocks, or which of the four dark blocks, is used is chosen at random and carries no data. That randomness is what makes the molecule prohibitively difficult to replicate. Color here stands for the molecular structure; it is not a color you could see on the item.

✓ Written at random, verified by chemistry. There is no master copy to steal and no formula to reverse.

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