

The importance of expert interpretation in hair testing

Mário Barroso, Head of R&D and Method Development at AlphaBiolabs, examines the role of expert interpretation in providing fair, accurate hair drug and alcohol test results for family proceedings



Hair testing is an established tool in family proceedings, providing a retrospective view of drug and alcohol exposure over several months that's particularly useful when combined with tests for recent use, using samples such as blood, oral fluid, or urine.

However, laboratory analysis is only part of the process. Expert interpretation, drawing on the broader circumstances of the case and the sample donor's history, ensures results are interpreted fairly and accurately.

The result alone does not tell the whole story

Positive results

A common misconception is that a positive hair drug test automatically indicates illicit drug use.

However, correct interpretation depends on several factors, including the substance, concentration, pattern across hair segments, and relevant background information.

For example, codeine metabolises in the body to morphine. Consequently, the detection of morphine in hair does not necessarily indicate direct morphine use and may simply reflect the use of a codeine-containing medication. Analysing the distribution pattern and concentration ratios of both drugs in hair is pivotal in distinguishing codeine use from morphine use.

Similarly, ADHD medications such as dexamphetamine can produce findings that overlap with illicit amphetamine use.

Incorrect conclusions could therefore be drawn if medical and prescription histories were not considered during interpretation.

Negative results

Conversely, a negative drug or alcohol test result does not always prove that

no substances were used. Hair testing is effective at identifying repeated or ongoing use, but a single, low-dose exposure – such as one-off cannabis or cocaine use – can be harder to detect.

Similarly, hair alcohol testing for the biomarkers Ethyl Glucuronide (EtG) and Ethyl Palmitate (EtPa) is designed to identify chronic, excessive consumption, so a single drinking episode is unlikely to be detected by hair testing alone.

Combining hair and blood alcohol testing gives a more complete picture. PEth blood testing, for example, can detect a single drinking episode for up to 12 days after consumption.

Other factors that shape interpretation

Cosmetic treatments

Hair treatments such as excessive bleaching, dyeing and chemical straightening can alter the concentration of certain substances in hair.

For a hair alcohol test, EtG concentrations can be decreased by excessive bleaching or dyeing, while EtPa levels can be elevated by alcohol-based styling products such as sprays, gels or wax.

This does not mean these factors eliminate evidence of misuse or produce a false positive result. However, they must be considered by the Reporting Scientist during interpretation, and the sample collector will therefore always ask about and log any use of hair treatments and styling products when collecting the sample.

Environmental exposure

A child living in a household where drugs are regularly smoked or handled may show low-level findings that do not necessarily indicate active consumption. Modern laboratory

procedures, including washing protocols and metabolite analysis, help distinguish environmental exposure from ingestion.

Segmented analysis

Head hair can be segmented into an approximate timeline of use, based on an average growth rate of 1cm per month.

However, individual hair growth rates can vary with ethnicity, diet, health and other factors, which should all be considered when interpreting results.

Context is essential

Perhaps the most important principle in hair drug and alcohol testing is that results should never be interpreted in isolation.

The laboratory result is just one piece of a wider evidential picture, with clinical history, prescriptions, disclosures and witness statements all contributing to a balanced assessment.

Similar analytical results may be obtained for two different people, yet the interpretation could be very different depending on the wider circumstances of each case.

Accredited hair testing you can trust

AlphaBiolabs offers the UK's most comprehensive portfolio of legally-instructed drug and alcohol testing services, backed by over 20 years' experience supporting family law professionals, social workers and local authorities.

We are UKAS 17025-accredited (Lab 51 extension for toxicology), employ in-house toxicologists and Reporting Scientists with decades of collective experience, and offer free sample collection for legally-instructed tests at our nationwide walk-in centres.

To request a quote, contact our New Enquiry team on 0333 600 1300, email testing@alphabiolabs.com, or complete our online quote form at <https://www.alphabiolabs.co.uk/legal-test-forms/>.

Mário Barroso, Head of R&D and Method Development at AlphaBiolabs

Mário leads AlphaBiolabs' technical team on developing and improving testing methods.

Prior to joining AlphaBiolabs, Mário spent 20 years as a Forensic Toxicologist at the Portuguese National Institute of Forensic Medicine, where he developed and implemented hair testing services.

He also sits on the Administration Board of the Society of Hair Testing.



AlphaBiolabs™