centre for forensic science
To excel in forensic science for the purpose of law enforcement, medico-legal investigations, and administration of justice.

**Core Functions**
- Its Criminalistics Laboratory examines physical and trace evidence for law enforcement agencies.
- Its DNA Profiling Laboratory provides DNA profiling expertise for criminal investigation.
- Its DNA Database Laboratory collaborates with the Police on a fully automated system for DNA samples.
- Its Narcotics Laboratory conducts analysis of narcotic drugs in drug seizures and urine of drug abusers.
- Its Toxicology Laboratory provides analytical services for drugs and other toxic substances for patients and post-mortem specimens including emergency toxicology analysis after office hours.
- Its Document Examination Laboratory provides expert analysis and opinion in handwriting, signatures, typewriting, forgery, alteration on ink and paper and other related materials for both the public and the private sectors.
The Centre for Forensic Science (CFS), one of HSA’s centres, was formerly part of the Institute of Science and Forensic Medicine.

CFS provides a one-stop forensic science service and consultancy to law enforcement agencies, government ministries, hospitals, private organisations and individuals for criminal and medico-legal investigations and civil disputes. Its 7 laboratories provide specialised scientific, investigative and analytical expertise in the areas of criminalistics, DNA profiling, narcotics, toxicology and document examination.

For FY 01, CFS completed a total of 73,252 samples with a total revenue of $14.86 million.

Re-accreditation by ASCLD/LAB
CFS has achieved international standards and recognition by being one of the few non-US laboratories accredited by the American Society of Crime Laboratory Directors/Laboratory Accreditation Board (ASCLD/LAB), an international benchmark accreditation scheme.

In June 01, CFS was re-accredited by ASCLD/LAB for another 5 years in the disciplines of controlled substances, toxicology, trace evidence, serology, DNA, firearms/toolmarks and questioned documents. This re-accreditation demonstrates CFS’ commitment to ensuring best practices to support the administration of justice in Singapore.

Workload Statistics

<table>
<thead>
<tr>
<th></th>
<th>Criminalistics Lab</th>
<th>DNA Profiling</th>
<th>Document Examination Lab</th>
<th>Narcotics I Lab</th>
<th>Narcotics II Lab</th>
<th>Toxicology Lab</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample Received</td>
<td>912</td>
<td>2,546</td>
<td>350</td>
<td>5,183</td>
<td>46,726</td>
<td>17,535</td>
<td>73,252</td>
</tr>
<tr>
<td>Work Value (Man Hours)</td>
<td>6,168</td>
<td>13,298</td>
<td>3,902</td>
<td>28,057</td>
<td>23,754</td>
<td>26,812</td>
<td>101,991</td>
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ASCLD/LAB Certified Inspectors

In August 01, 14 forensic scientists passed the ASCLD/LAB Inspector Training Course to be certified inspectors. One officer has since been appointed as inspector to audit the Florida Palm Beach County Sheriff’s Office in December 01.

International Reference Laboratory for Seized Materials

In June 01, the Narcotics I Laboratory was invited by the United Nations International Drug Control Programme to be a reference laboratory for the seized materials group. This international collaboration re-affirms CFS’ high quality service standards.

CNB-CFS Data Transmission

The electronic data transmission between the Central Narcotics Bureau (CNB) and Narcotics II Laboratory was fully established in 2001. The linkage facilitates the daily registration of urine sample submissions and provides the means to upload analytical results onto CNB’s main server. The system allows CNB to track online the receipt of urine samples and to receive the analytical results electronically.

New DNA Database Laboratory

In collaboration with the Police, CFS set up a DNA Database Laboratory in April 01 to build a fully automated system for DNA samples of convicted offenders. 9 officers were recruited and trained in-house with the necessary skill and knowledge for the new laboratory which targeted to be operational in 2002.
DNA Profiling Laboratory
In June 01, the DNA Profiling Laboratory introduced a new DNA paternity testing service using the PCR-STR technology for the private sector/clients. Since then, 112 cases comprising a total of 324 samples was submitted to the Laboratory.

Criminalistics Laboratory
The Criminalistics Laboratory acquired 5 additional infrared spectral libraries to augment its capabilities in Fourier-Transform infrared microspectrophotometry for the identification and comparison of unknown materials in trace amounts. This facilitated the identification of chemicals used in 18 anthrax hoax local cases after the 911 tragedy.

Document Examination Laboratory
The Document Examination Laboratory completed a research project on the “Investigation of Class Characteristics in the English Handwriting of the 3 Main Racial Groups - Chinese, Malay and Indian” in February 02. It has also conducted a series of workshop/seminar on “Screening of Forgeries and Counterfeits” for local banks and insurance companies since October 02.

Toxicology Laboratory
The Toxicology Laboratory has expanded its workplace drug testing programme with the validation of the kinetic interaction microparticles in solution (KIMS) method for the screening of barbiturates, methadone, methaqualone, phencyclidine, propoxyphene and benzodiazepines.

Scholarships
For the first time, 2 laboratory officers from CFS were awarded the Health Manpower Development Programme (HMDP) scholarships in September 01 to pursue their Masters in Science at universities in the United Kingdom.

Research & Development
CFS has initiated 9 research projects and submitted 7 papers for presentation at international conferences.
The Year Ahead

To better anticipate and meet clients’ needs and requirements, CFS will forge closer rapport with major clients through discussions and signing of service level agreements.

The Criminalistics Laboratory has acquired a gas chromatograph (GC) equipped with an automated solid-phase microextraction (SPME) autosampler and a ceramic-tip flame ionisation detector to develop advanced techniques in sample preparation such as selective concentration and sample clean-up of trace amounts of organic compounds in a variety of matrices. This GC will be upgraded to tandem mass spectrometry to conclusively identify individual organic compounds, and to fully exploit the automated SPME autosampling capabilities.

The DNA Profiling Laboratory will validate the Y chromosome method to complement the existing STR DNA paternity testing and will also validate the mitochondrial sequencing method for human remains.

The Narcotics II Laboratory will initiate a project to study the screening of ketamine in urine by Enzyme-Link Immunosorbent Assay (ELISA). Upon completion, the Laboratory will be able to provide a large scale screening programme for CNB to curb the abuse of ketamine in Singapore.

The Toxicology Laboratory will introduce the gas chromatography/mass selective detector method for the analysis of gamma hydroxy butyrate (GHB) in blood and urine specimens for suspected drug assisted sexual assault cases.