

Delivering value to people

Tecan provides life science research and the diagnostic industry with laboratory instruments and comprehensive automation solutions. Tecan also offers solutions for other applied markets such as forensics, the food industry, crop research, the cosmetic industry and veterinary applications. The company serves some customers directly, but is also a leader in developing and manufacturing OEM instruments and components that are distributed by partner companies under their own names. Automation solutions include instruments, software packages, numerous configurable modules and special application expertise as well as regulatory and quality consulting, service and consumables.

Tecan's solutions automate all types of repetitive work steps in the laboratory and make procedures more precise, more efficient and safer. They also pipette the smallest volumes of different fluids with optimum precision. By automating these work steps, laboratories can significantly increase the volume of samples they process, obtain test results sooner and ensure reproducible output. The instruments can also perform necessary work overnight without supervision, allowing laboratory personnel to evaluate the results or continue with the next step upon returning the following morning. Tecan also offers a wide range of detection devices that includes analytical devices such as microplate readers and microarray systems, which analyze reactions on a microtiter plate or a microarray, as well as washers, which perform the washing and separating steps of a test procedure.

A small sample of applications from various markets is presented on the following pages.

Life science research

Tecan supplies laboratory solutions to government research institutions and universities as well as the life science industry. These solutions are employed at all process levels, from basic research to drug development at pharmaceutical companies. Tecan has a broad product portfolio for life science research.

Genomics



The genome, an organism's genetic material, contains all of a cell's hereditary information. Scientific studies on various organisms are relevant for medical, pharmaceutical and application-oriented research as well as basic research. Tecan supplies a number of automation solutions in the area of genomics and generates a significant portion of its sales in genomic applications, where Tecan instruments are used primarily for sample preparation. Below are a few examples:



Analyzing a sample's DNA requires automation of numerous different work and analysis steps. First, the DNA must be extracted. The goal is to extract the highest possible volume of the purest possible DNA from the samples. Different samples each contain different amounts of DNA. The amount of DNA in each sample must first be ascertained (quantification). A standardized concentration (standardization) is then achieved by diluting the samples. DNA is replicated through polymerase chain reaction (amplification). Replication is performed to provide an ample amount of DNA for subsequent analysis.

Tecan's microarray scanners and hybridization solutions are used by leading genetics laboratories as well as an OEM customer that is a global diagnostics company. For example, the PowerScanner™ can analyze over two million data points on a microarray in a matter of minutes. These molecular biological assay systems, which are supplied with massive quantities of data, are increasingly used in genome analysis. In the field of functional genome research, analyzing chromosomal changes, for example, allows researchers to gain a clearer understanding of the genome and thereby possible causes of disease as well.

For the rapidly growing application of genome sequencing ("next-gen sequencing"), important sample preparation was performed with Tecan automation in collaboration with various instrument manufacturers. Only through efficient sample preparation that meets the high throughput of the sequencing instruments can bottlenecks in test procedures be prevented.

- 1 Scientist in a genomic laboratory
- 2 PowerScanner™: high resolution microarray scanner
- 3 Multi-channel pipetting head MCA™ 384 with 384 parallel fluid channels and disposable tips
- 4 Loading of reagents on a Tecan liquid handling platform
- 5 Numerous modules allow to automate complete workflows
- 6 Scientists in a cellular biology laboratory in front of a Tecan liquid handling platform

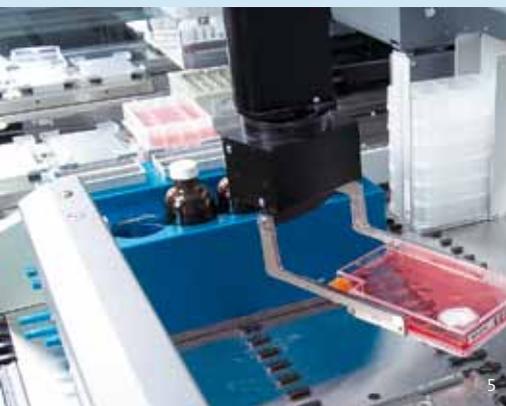
Pharmaceutical research

Discovering new substances against a wide range of diseases and ascertaining their effectiveness requires complex test procedures. The immense number of experiments is possible only with a high level of automation in the research laboratory. Below are several examples of uses for Tecan solutions:

Tecan automation allows millions of chemical substances to be tested to determine if they are promising candidates for innovative drugs. For example, a laboratory can significantly increase screening throughput by using multi-channel pipetting heads with 96 or 384 parallel fluid channels and the corresponding certified plastic pipette tips. Tecan detection instruments can generate test results using various optical methods.

Researchers can also examine how a substance is absorbed, distributed in the body, biochemically converted and broken down and finally excreted (absorption, distribution, metabolism and excretion).

Tecan instruments can also make sample preparation more efficient: from automated weighing stations, different extraction methods, integrated centrifugation steps all the way to tracking samples by barcode. With a wide range of configurable modules and numerous partnerships, comprehensive workflow-solutions are possible.



Cellular biology

Cellular biology researches biological processes at the cellular level. As this field continues to grow in significance, so does the need for cells. Below are a few examples of Tecan automation solutions in this field:

An increasing percentage of pharmaceuticals are now produced using biotechnology methods. Manufacturing targeted pharmaceuticals, such as monoclonal antibodies for example, requires cells that produce the antibody and can also continue to divide. For this purpose, cells with specific characteristics are combined with continuously dividing cancer cells. The cells selected from the several million daughter cells are those that produce

the most antibodies, grow as sparingly as possible, divide well and cease to lose any of these characteristics. The few cells selected are then replicated and excrete the desired antibody into the medium. All work steps from cell cultivation to cell fusion, harvest, selection and expansion all the way to the necessary laboratory logistics can be conducted using Tecan liquid handling platforms and detection instruments.

Numerous partnerships make it possible to automate additional important steps in the processing and analysis of different cells.

Diagnostics

Tecan offers automation solutions for numerous diagnostic applications. While customers include blood banks, medical laboratories and hospitals, the OEM channel generates the most sales in the area of diagnostics. Tecan's partners distribute system solutions under their brand names that combine the automation developed by Tecan with their specific tests. Several examples of automation solutions for our diagnostic or OEM partners are described below:

Blood type testing and tests for infectious diseases



Numerous tests are necessary before a patient can receive a blood transfusion from a donor. Prior to transfusion, the patient's blood type and other parameters are ascertained. The donor's blood must be compatible with the patient and free of infectious pathogens. Tecan offers various automation solutions for this process.

In its end-customer business, Tecan supplies a flexible pooling and archiving solution on a single platform to blood banks. Several blood banks individually examine blood donations for infectious diseases, while others pool the samples of different donors prior to testing. Tecan also gained a global diagnostic company as an OEM customer for this automation solution.



In many countries, two analytical procedures are performed parallel to one another when testing for infectious diseases: molecular diagnostic methods are employed to examine the blood directly for the genetic material of a pathogen and, in an indirect method, for antibodies against the pathogen (ELISA procedure). If antibodies against diseases such as HIV or HCV (hepatitis C), for example, are found in a blood sample, it would indirectly indicate that the donor and thus his or her blood are infected with the pathogens. Tecan's flexible ELISA automation platforms are available for end customers and OEM partners to develop their specific applications or system solutions that are then sold under their own brand name.

Tecan supplies automation to several OEM partners in the field of blood type testing. A leading diagnostics company has incorporated Tecan automation with their reagent cassettes to provide the world's most frequently used instrument for this purpose. All work steps from pipetting, incubation and centrifugation all the way to results analysis are fully automated.

- 1 Automated sample identification and tracking using barcodes
- 2 Clinical ELISA platform Freedom EVOLyzer®
- 3 Fully automated RNA and DNA extraction
- 4 Pooling of blood samples to increase efficiency
- 5 Double helical structure of DNA
- 6 Specific configuration of modules for DNA extraction

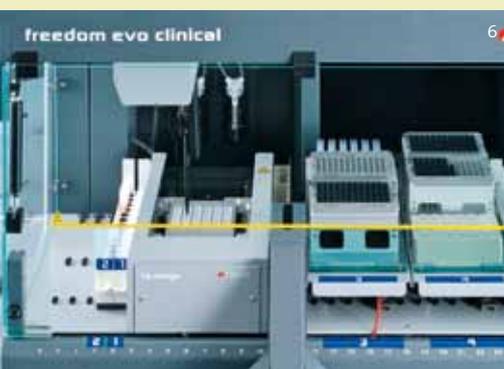
Molecular diagnostics

In the field of molecular diagnostics, diagnostic examinations and analyses are performed at the level of genetic material. For example, blood samples are examined for the DNA of pathogens, and patients are tested for hereditary diseases or a predisposition to a specific disease. Tecan supplies this rapidly growing market primarily with solutions for time-consuming sample preparation.

Tecan supplies one of the most successful molecular diagnostic platforms as an OEM instrument to a global diagnostic company that markets the system solution with a wide range of different tests. Tecan also supplies automation to another partner who has developed a molecular diagnostic test to detect the human papillomavirus (HPV). Robotic modules and precision pumps from Tecan are used as an integral component in another widely

distributed high-throughput instrument used in the area of molecular diagnostics. Tecan plastic pipette tips are employed in system solutions and their degree of purity has been certified by an external institute to rule out the possibility of contamination with foreign DNA.

There is a growing need for molecular diagnostic solutions that will enable patients to be tested for different pathogens on site, i.e. at the doctor's office. In early 2010, Tecan signed an OEM agreement with a diagnostic company concerning the production and supply of a point-of-care molecular diagnostics instrument. The system is in development and will require regulatory clearance.



Companion Diagnostics

Molecular diagnostics are closely linked with the possibilities of personalized medicine. Drug therapy is increasingly accompanied by a diagnostic test that is able to identify who will respond better to a certain therapy or have a higher risk of side effects.

Tecan supplies an automation solution for this area of application to a leading diagnostic company. Tests developed by a partner company measure the viral load in HIV patients and identify mutations of the virus allowing the treating physician to monitor the effectiveness of drug therapy and adjust it if necessary.

Applied Markets

Tecan supplies automation solutions for forensic laboratories and numerous other applied sciences such as veterinary medicine, environmental technology, the cosmetics industry and the food and beverages sector. In many areas, the degree of automation is still low. Tecan offers a range of solutions for the increasing testing volume:

Forensics



In law enforcement and criminal justice, traces of genetic material collected at the scene of the crime are increasingly becoming an important tool alongside the classic evidence-gathering method of fingerprinting. This results in a considerable increase in testing volume. Revisiting closed cases has also led to an immense backlog of DNA samples to be processed. Tecan is the global market leader in fully automated solutions for forensic laboratories.

Together with the leading manufacturer of DNA testing systems, Tecan offers the integrated HID EVOLution™ system. Armed with this system, forensic laboratories have a validated solution that allows them to process DNA samples more quickly and securely. Plastic consumables from Tecan are an important component of validated forensic solutions.



Traces of materials are collected at the scene of the crime in the hope that they contain DNA. The traces can be in solid or liquid form and can originate from many different people – including the perpetrator. They can be substances such as hair, saliva on cigarette butts, skin tissue, blood on pieces of clothing or other human secretions. The traces are processed in a number of stages in a forensic laboratory run, for example, by a law enforcement agency. The result is an individual DNA sequence – a kind of genetic barcode. The likelihood of two different people sharing an identical sequence occurs only once per 10^{15} people.

- 1 Use of disposable tips to avoid cross-contamination
- 2 Integrated and validated HID EVOLution™ System
- 3 DNA extraction for diagnostic testing of livestock
- 4 Freedom EVOLyzer® with integrated Tecan detection devices
- 5 Scientist with Tecan HydroFlex™ ELISA plate washer
- 6 Increased efficiency and safety of laboratory procedures

Diagnostic testing of livestock

Infectious diseases and various viral and bacterial infections in cattle, swine or poultry must be detected as early as possible to prevent them from threatening entire livestock populations and becoming pandemic. This requires powerful automation solutions for the relevant agricultural authorities and veterinary laboratories. Tecan's existing workflow solutions are flexible and can also be used for these applications.

In recent years, there have been outbreaks of bluetongue in northern European countries, a disease previously found only in warmer climes. This insect-borne viral disease occurs primarily in sheep and cattle and can have drastic consequences for the farmers and regions concerned. Using Tecan liquid handling platforms, veterinary laboratories can provide reliable test results as soon as an outbreak occurs.

Based on these results, the authorities can then introduce measures such as establishing restricted areas and vaccination programs.

The same technologies and procedures are used in diagnostic testing of livestock as in humans, for example molecular diagnostic methods or the ELISA procedure. Different testing programs are needed due to varying national requirements. This demands flexible automation solutions of the kind Tecan offers.

Laboratories performing infectious disease testing incorporate Tecan automation for diseases that are contagious to humans as was the case, for example, with the bird flu outbreak.



Food development and crop research

Safety requirements are becoming ever more stringent in the field of food and beverages. Tolerance of impurities continues to diminish and genetic modifications have to be declared. Investments are also being made in targeted improvements in quality through the use of scientific methods. Existing Tecan automation solutions are also used in this area.

At a research institute for wine production, experts use chemical, microbiological and molecular biological methods to test all the elements that define the flavor of the finished product and make a good wine, from the selection of specific yeast strains and grape varieties to fermentation methods. Use of a liquid handling platform and a detection device from Tecan has greatly increased the number of tests performed to several hundred per day.

In order to ensure the supply of food for the growing global population, researchers are working on developing improved seed stocks for crops such as rice, maize and wheat. The aim is to produce significantly higher crop yields under the same conditions. To this end, both modern plant selection and biotechnology methods are used. Tecan automation solutions play an important role here, for example in work processes in the area of genomics. Tecan automation solutions have been installed worldwide by a leading crop research company. By using multi-channel pipetting heads with 96 parallel fluid channels and the corresponding certified plastic pipette tips, the company has been able to significantly increase the number of tests performed and make its laboratory procedures more precise, efficient and safer overall.

Tecan's Products, Business Structure and Markets

Life Sciences Business

- Focused on all end-customer activities
- Products marketed under the Tecan brand through own sales & service organizations and distributors

Partnering Business

- Focused on all OEM activities
- Products sold by partners under their own brand

Life science
research

Diagnostics

Applied
Markets

About Tecan

Tecan (www.tecan.com) is a leading global provider of laboratory instruments and solutions in biopharmaceuticals, forensics and clinical diagnostics. The company specializes in the development, production and distribution of automated workflow solutions for laboratories in the life sciences sector. Its clients include pharmaceutical and biotechnology companies, university research departments, forensic and diagnostic laboratories. As an original equipment manufacturer (OEM), Tecan is also a leader in developing and manufacturing OEM instruments and components that are then distributed by partner companies. Founded in Switzerland in 1980, the company has manufacturing, research and development sites in both Europe and North America and maintains a sales and service network in 52 countries. In 2010, Tecan generated sales of CHF 371 million (USD 356 million; EUR 269 million). Registered shares of Tecan Group are traded on the SIX Swiss Exchange (TK: TECN/Reuters: TECZn.S/ ISIN: 12100191).

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