



School Lab

Website

www.nccr-transcure.ch

→ Outreach

Workshop Location

**Department of Chemistry and
Biochemistry (DCB)**

University of Bern
Freiestrasse 3
3012 Bern

Arrange a Visit

To book our half day demonstration
please contact us by e-mail at
valentina.rossetti@transcure.unibe.ch
Booking must be made minimally 3
weeks in advance.

This event is organized by

NCCR TransCure

University of Bern
Murtenstrasse 35
CH-3008 Bern
and

**Department of Chemistry and
Biochemistry (DCB)**

University of Bern
Freiestrasse 3
3012 Bern

Fees

The school lab is free of charge.

Purpose

Our educational program is developed to promote science and increase the interest for and understanding of science by the general public. It specifically aims at encouraging young students to choose science options during their studies and eventually pursue with a scientific career. The students and their teachers will participate to exploratory encounters with active researchers in the worlds of chemistry and biology.

Safety Rules

During the whole visit, the group must be accompanied by a responsible person, who ensures that all behavioral and safety rules provided by the scientists are respected. Any inappropriate behavior or not respecting the safety rules will automatically exclude the participant. At worst, the scientists can decide to cancel the demonstrations and send everybody home.

Target Audience

Our hands-on laboratory is open to groups of 10-25 students aged between 14 and 17 years old. The scientific level is of secondary schools.

When

The program is opened outside the academic semesters:

- January to mid-February
- June to mid-September

The workshop lasts half a day and usually takes place between 14h and 17h. The exact duration can vary according to the number of participants and the chosen demonstrations.

Please arrive a few minutes before the start to allow our scientists to welcome you.



School Lab: Practical Experiments



Inks Analysis

The thin layer chromatography (TLC) is used to separate components of a mixture. TLC is performed on a glass or an aluminium plate covered with silica as solid phase; a solvent or a mixture of solvents (eluent) will be used as mobile phase. The sample will be deposited on the plate and, depending on its affinity to the silica (its polarity); it will migrate close or far thanks to the selected eluent. In this activity, a murder left a word on the crime scene! Some suspects were arrested with a pen in their hands! Discover using the TLC method, which one is the murderer!



Fun with liquid nitrogen

Nitrogen is the main component of air (80%). Air can be liquefied at high pressure and nitrogen separated from oxygen and other gases by fractional distillation. Liquid nitrogen has a temperature of $-196\text{ }^{\circ}\text{C}$. During this activity different things will be frozen in liquid nitrogen (such as roses, balloons, eggs, ping-pong balls, apple, banana, plastic stuffs...). For you to observe what happens!!!



Acide Base Titration

Titration is commonly used in analytical chemistry to determine the unknown concentration of a define compound. In the more specific case of the acid-base titration, a base is added to an acid (and vice-versa), the acid is so neutralized by the base leading to a change in the pH. This neutralization can be followed by change in color of an indicator. Indicators are compounds whose color changes with the pH.

For the experiment, we propose to fill a burette with a base (sodium hydroxide 0.1 M) and the becher with an acid (hydrochloric acid 0.1 M). Two indicators (methyl red and bromothymol blue) are added to the acid solution in the becher. The solution, red at the beginning, will become blue by addition of the base.

But be careful: between the red and the blue color, yellow appears. One drop too much and the red turns immediately into blue. It's your go!



Pipetting

Participants will be able to use the most common tool in biology laboratories: the pipette. The challenge for the participants will be to fill as fast as possible in the wells of a “microtiter plate” with various colored solutions.

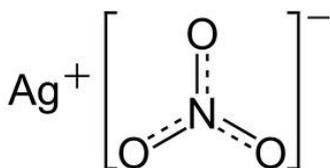


Acid or basic, that is the question Red cabbage contains the dye Cyanidine, compound whose color change as function of the pH. In acidic media, cyanidic appears to be red/rose, in basic media it turns blue and becomes green in very basic media. A few drops of a filtered solution of cooked red cabbage will be added to different substances (lemon juice, vinegar, water, soap, washing powder...) and based on the observed color the pH of the solution will be estimated.



Column chromatography with mint syrup

Column chromatography is a common method of separation in organic synthesis which allows separating different compounds present in a mixture. Commonly, a glass column is filled with a solid support (commonly silica). The sample is put down at the top of the column and the different components of the sample are separated by an eluent (mobile phase) through the column. The separation is based on the difference of affinity between the silica and the components which move at different speed. In this activity, the two food coloring agents from mint syrup (yellow E102 and blue E131) will be separated by column chromatography.



Secret messages

Silver nitrate is a salt with the chemical formula AgNO_3 . An AgNO_3 solution gives stable metallic silver when exposed to the light. By using a silver nitrate solution, you will be able to write a message which will be put in a dark place to dry. The message will be exposed to the light and appears!