

Kvarterní struktura proteinů

Analytická ultracentrifuga, DLS – exkurze

Aplikovaná bioinformatika, Jaro 2016

Analytická ultracentrifuga (AUC)



ProteinLab XL-A Protein Characterization System



POWER OFF
CAUTION - READ MANUAL
BEFORE OPERATING
ATTENTION - CONSULT LA NOTICE
AVANT DE FAIRE FONCTIONNER L'APPAREIL
BECKMAN
COULTER
SERVIS. PŘÍSTROJÍ
NONSTOP. HOTLINE
TEL. 372 017 888

KEEP THE ROTOR CHAMBER CLEAN AND DRY
Wipe the chamber down between runs



60 000 rpm (otáčky/minuta)

Přetížení 500 000 g

1 g = 0,5 t

**A všechny součástky to musí
vydržet...**

Titanový rotor

Vakuum – minimalizace tření



Když vypne uprostřed měření proud, tak se centrifuga zastaví sama za dva dny

Když se utrhne rotor...obsluha by to měla přežít (když bude jinde)

<https://www.aiha.org/get-involved/VolunteerGroups/LabHSCCommittee/Incident%20Pages/Lab-Safety-Centrifuge-Explosions-Incidents.aspx>

On December 16, 1998, milk samples were running in a Beckman L2-65B ultracentrifuge using a large aluminum rotor (a rotor is a large metal object that holds the individual sample tubes and is connected to the spin drive of the centrifuge). The rotor had been used for this procedure many times before. Approximately one hour into the operation, the rotor failed due to excessive mechanical stress caused by the "G" forces of the high rotation speed. The subsequent explosion completely destroyed the centrifuge ([picture 1](#))([picture 2](#)).

The safety shielding in the unit did not contain all the metal fragments. The half-inch thick sliding steel door on top of the unit buckled allowing fragments, including the steel rotor top, to escape ([picture](#)). Fragments ruined a nearby refrigerator and an ultra-cold freezer in addition to making holes in the walls and ceiling. The unit itself was propelled sideways and damaged cabinets and shelving that contained over a hundred containers of chemicals ([picture](#)). Fortunately, sliding cabinet doors prevented the containers from falling to the floor and breaking. A shock wave from the accident shattered all four windows in the room. The shock wave also destroyed the control system for an incubator and shook an interior wall causing shelving on the wall to collapse ([picture](#)). Fortunately the room was not occupied at the time and there were no personal injuries.

The cause of the accident is believed to be the use of a model of rotor that was not approved by Beckman for use in a model L2-65B ultracentrifuge.

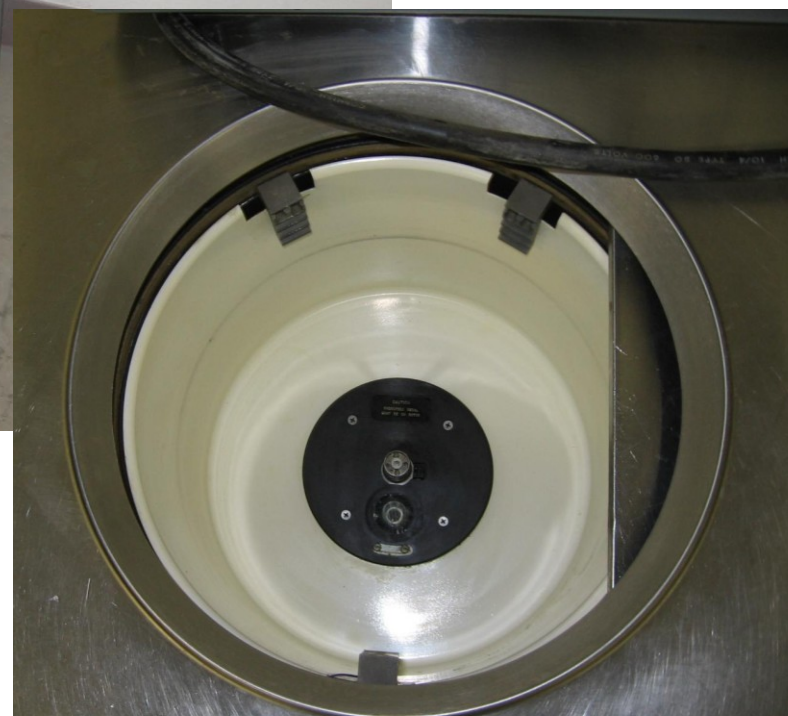
Centrifuge Explosion Damages Cornell

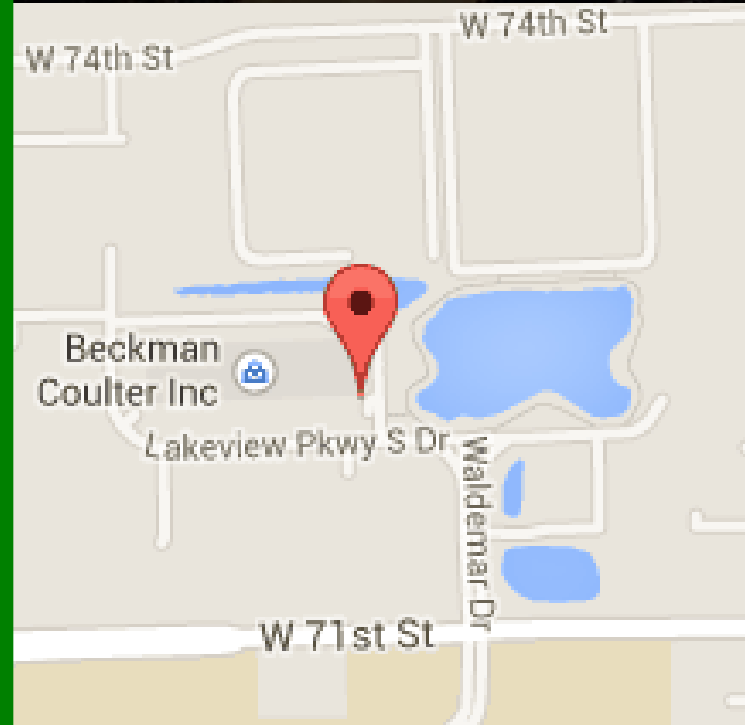




Beckman L2-65B

Takhle nějak vypadala předtím...

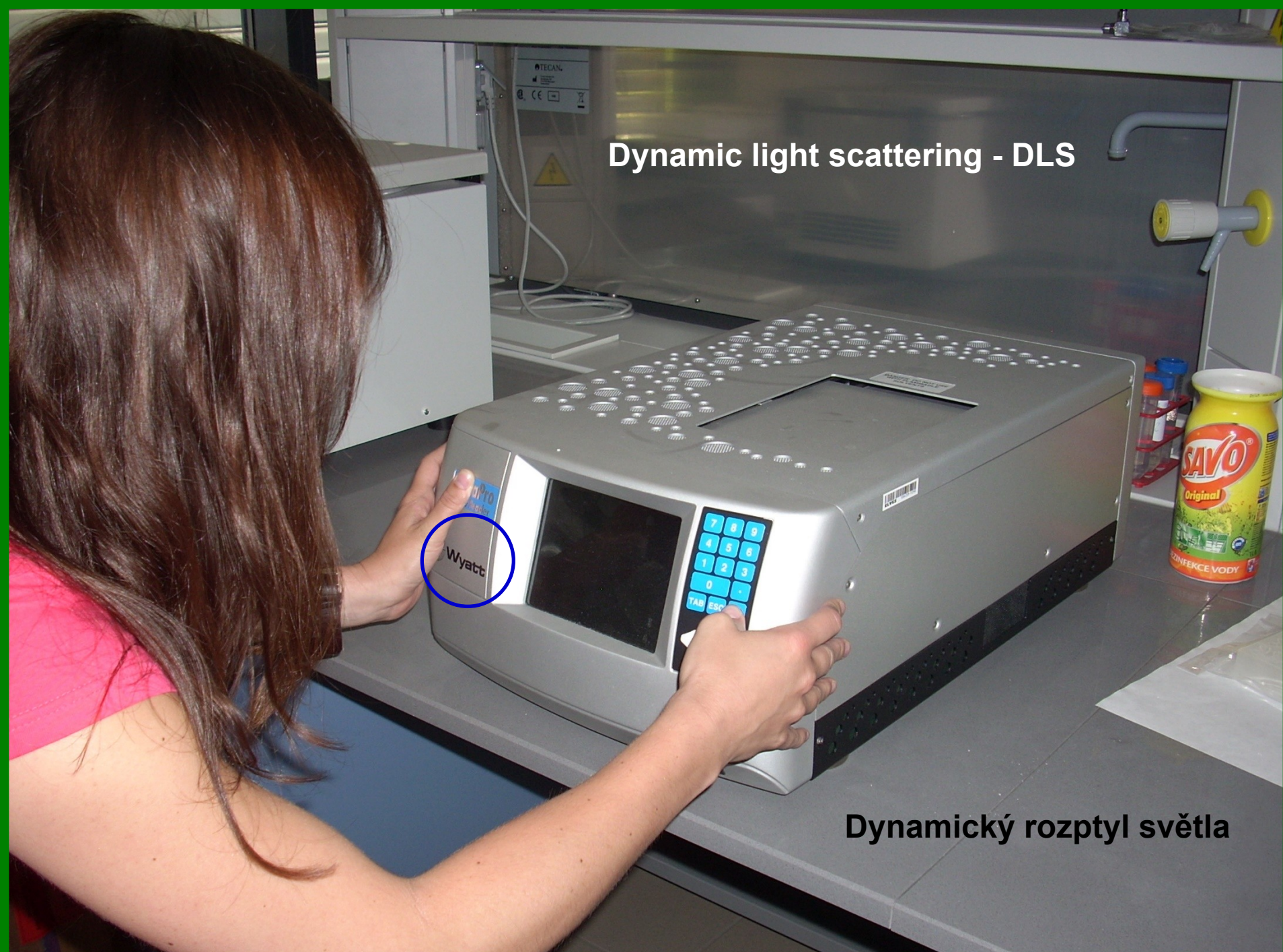




Indianapolis – hlavní
město ultracentrifugace

Jinak tam údajně není
nic...ani pěkný pohled

Dynamic light scattering - DLS



Dynamický rozptyl světla




DynaPro™ Plate Reader II

Automated, high-throughput, temperature-controlled Dynamic Light Scattering

Revolutionize your performance by transforming your conventional, batch dynamic light scattering system into the stable, automated DynaPro™ Plate Reader. The DynaPro™ Plate Reader incorporates state of the art technology, providing superior filter-free high throughput dynamic light scattering (DLS or QELS) performance. The **non-invasive** technology measures samples **directly** from industry-standard microplates (96, 384, or 1536 well plates) using as little as 4 microliters of sample per well. After the plate is loaded into the DynaPro™, the data are collected **automatically**, in an unattended manner, by the easy-to-use DYNAMICS® software, which supports full integration with industry leading liquid handling robotics. Once the data are collected the samples can be recovered and the plates discarded – **no cleaning** required!



<http://www.wyatt.eu/>

A woman with long brown hair, wearing a pink shirt, is smiling and looking towards the camera. She is standing next to a grey Wyatt DynaPro Ultra Reader machine. The machine has a keypad with blue buttons and a green 'ENTER' button. The top of the machine has a grid of small circular wells. The background shows a laboratory environment with a sink and a yellow container of SAVO Original disinfectant.

...není tak přesné jako AUC
...není tak dobrodružné jako AUC

...rychlejší
...USER FRIENDLY 😊