



BRADBURY

SCIENCE

museum

The Ribosome: A “3D protein nano-printer” essential to all life on earth and how it works.

The Ribosome is a unique opportunity for your guests to walk through a ribosome, the cell’s 3D protein nanoprinter, and watch proteins being made.

On the exterior of this compact exhibit, a ribosome “guide” escorts visitors along a timeline of ribosome history and research. Inside they’ll enter an atom-by-atom, augmented reality experience through the protein-building machinery of the human ribosome. Visitors can explore what a ribosome is, learn about the cutting-edge work of understanding protein synthesis—which can lead to new antibiotics, cancer therapies, and treating genetic diseases—and discover how the Lab’s supercomputing capability enables this work.

The Ribosome, curated by [Karissa Sanbonmatsu](#) of the Lab’s Theoretical Biology and Biophysics group, is a visually stunning interpretation of the ribosome, the cell organelle that makes all proteins. In addition to educational materials for student visitors and an original comic character to help our younger viewers understand the scientific concepts, the exhibit also features augmented-reality technology to transport visitors into a ribosome!

Who are our partners for *The Ribosome*?

Charité Institute of Medical Physics and Biophysics (Spahn Laboratory)

Weill Cornell Medical College (Blanchard Laboratory)

Additional sponsors include the National Science Foundation, the New Mexico Consortium, New Mexico State University, the University of New Mexico

Interesting facts:

- Ribosomes in human cells make a new protein roughly every three minutes.
- During their lifetimes, cells produce anywhere from tens of thousands to billions of proteins.
- Even a tiny bacterium contains anywhere from 10,000 to 100,000 ribosomes.

“Life is sometimes difficult to define, but usually you know it when you see it. Often characterized by growth, reproduction and replication of genetic information, one common thread ties together all forms of life: the ribosome” — Karissa Sanbonmatsu

Requirements

- Compact exhibit needs only 10’ x 10’ of space
- Ships in three ATA travel cases
- Sets up in 60 minutes
- Needs only one standard electrical outlet
- Includes promotional materials to help advertise it at your location
- Includes educational activity suggestions

Contact us to schedule this exhibit to your location!

Ribosomes Exhibit

Set-up and Dismantle Instructions

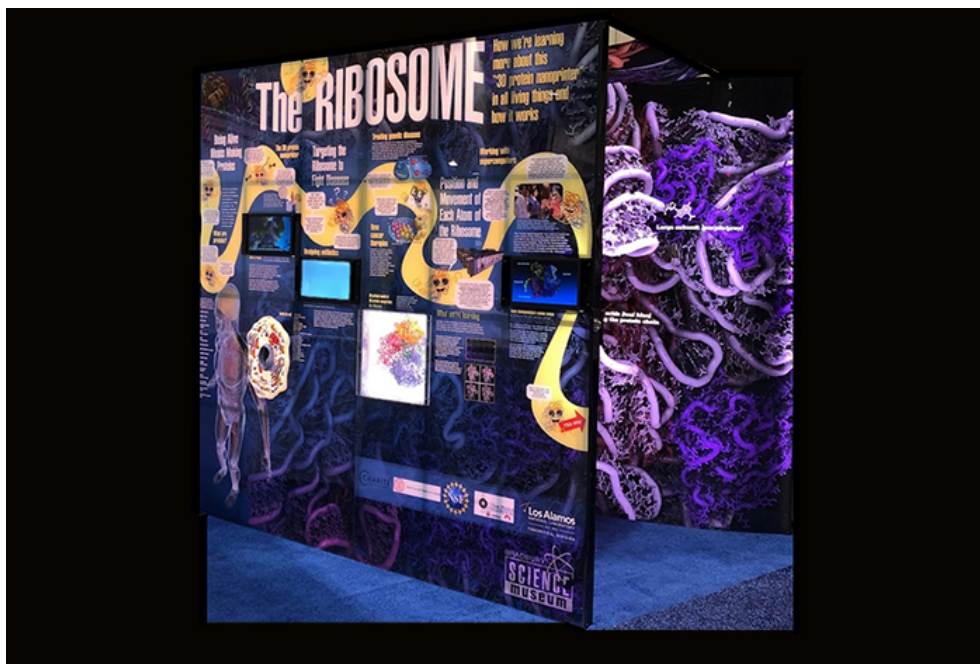


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The Ribosome

Exhibit Components

(2) Road Cases Containing Exhibit Sections

(#1) Front Exhibit Panels

(#2) Rear Exhibit Panels

(1) Road Case #3 Containing Installation Tools, Small Exhibit Components, Marketing Tools

iPad

Color-coded overhead crossbars (4)

Electrical connections (2)

Connecting hardware and tools and spares (Kit 1 and Kit 2)

Exhibit floor mat (1)

Exhibit overhead fabric panel (1)

Anti-static cloth for exhibit and screens

Remote controls (2) *plus 1 spare and extra batteries*

Black non-residue tape

Roll of Velcro

Packing foam and bubble wrap

You will also need:

Ladder

Gloves

Tape Measure

Anti-static Cloths

The Ribosome

Exhibit Installation (REQUIRES 2-3 people)

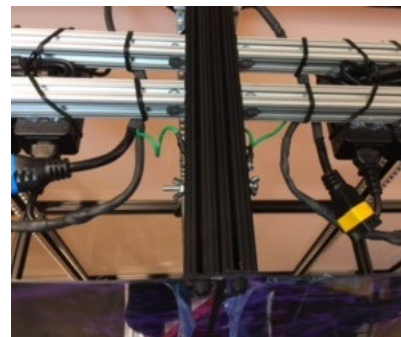
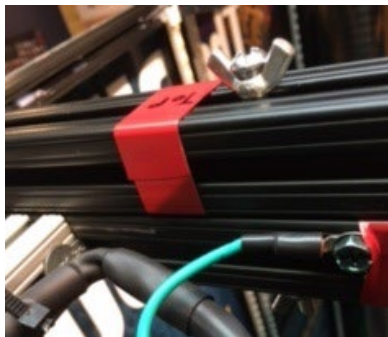
1. Identify location for installation
2. Bring cases with exhibit sections to installation site
3. Mark floor with tape to identify where you will place the rear section once you stand it upright
4. Open case end of case marked "Rear Wall."

Rear Wall-Please avoid dragging the exhibit on the floor as the plastic may catch and warp or break.

First Section: Ease exhibit from case, keeping exhibit section level. When you expose the far end of the exhibit, set it on the floor. Raise section, set section upright, and align it with location for exhibition using tape on floor as your guide. Pull electrical cable that is nested inside back section out through hole in back of exhibit. Pull only the length you need to reach your outlet. Attach electrical cable to white receiver and plug receiver into your intended outlet. At this point, one person must steady the section while the other two now remove the second section from the case.

Second Section: Follow the same steps listed above and move it into position, aligning it with the first rear section.

Connections: Connect the rear sections using the butt fastener (hex driver) and wingnut and alignment bolt (screwdriver) as shown below:



Be careful not to drop the wingnut inside the exhibit as you'll have to move the section to retrieve it.

Floor Mat

Place floor mat in front of rear section, fitting the curvature of the wall. The floor mat is now your guide for where the front sections need to sit in order for the connecting rods to reach.

The Ribosome

Front Wall

First Section: Ease exhibit from case, keeping exhibit section level. When you expose the far end of the exhibit, set it on the floor. Raise section and align it with location for exhibition using floor mat as your guide. Set the section upright.

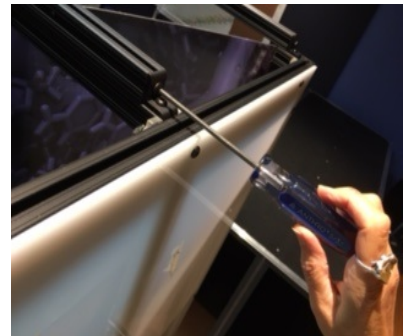
Second Section: Follow the same steps listed above and move it into position, aligning it with the first front section.

Connections: Follow the same steps as for the rear sections.

Overhead Crossbars and Power Cables

With the overhead crossbars from Road Case #3, connect the front and rear sections of the exhibit. The crossbars are color coded and are marked as to which surface should face upwards or “Top.” The snaps on the crossbars are for attaching the overhead fabric panel and should face downward.

Connect crossbars: Using hex driver and screws from Kit 1, attach overhead crossbars, attaching to L bracket on top of front and rear sections as shown. Then use alignment bolts with wingnuts to secure brackets.



Connect power cables: Attach color-coded (yellow and blue) power cables from front section to their mates on the back section.



Overhead Fabric Panel

Attach overhead cover: Using snaps on bottom of overhead crossbars, attach fabric panel.

The Ribosome

Lighting

Turn on exhibit lighting: Using white remote from Kit 1, stand in front of exhibit and turn lighting on. Place white remote in Kit 1 when not in use.

O = Shut Down

– = Start Up

Video Players-They should come on automatically with the power. If not:

Turn on video players: Using Nix remote from Kit 1, stand in front of exhibit and turn on video players.

Play videos: Press Home button → select USB → select Card → select movie → OK.

Set timing on video players: Press Home button → select Tools → select Settings → select Sleep Schedule → select Settings → select OK.

Video players are motion sensitive and will sleep during inactivity. Currently set for 5 minutes.

Augmented Reality

Turn on iPad: Turn on iPad by pressing the power or home button. The code is 900501.

Launch App by pressing the Ribosome exhibit icon in the dock.

(Be sure to test out the augmented reality app to see how it works in case visitors need assistance)

Triple click the home button to start Guided Access.

To turn off, first turn off Guided Access, then close app and turn off iPad.

Dismantle (REQUIRES 2-3 people)

1. Arrange cases to be easily accessible to avoid undue handling of exhibit sections
2. Remove case doors

Floor Mat and Overhead Fabric Panel

Roll floor mat and secure in its case. Unsnap and roll the overhead fabric panel, pack in small road case.

Overhead Crossbars and Power Cables

Disconnect power cables: Disconnect overhead, color-coded power cables and coil neatly on at the top of the exhibit, securing them with Velcro tape, but not *on top* as this will add length to the exhibit and may prevent the exhibit from fitting in its case.

Disconnect overhead crossbars: Using screwdriver and hex driver from Kit 1, disconnect the overhead crossbars and L brackets from the front and rear sections of the exhibit. Place hardware back in Kit 1. Place overhead crossbars in small road case.

The Ribosome

Front Wall

Connections: Disconnect the front sections, placing the butt fastener and wingnut in Kit 1.

First Section: Ease section from exhibit and place in case, with open side on the bottom and curved wall towards the outside of the case, keeping exhibit section level. Gently move exhibit into case marked "Front Wall."

Second Section: Follow the same steps as for first section. Place case door on and secure it.

Rear Wall

Connections: Disconnect the rear sections, placing the butt fastener and wingnut in Kit 1.

First Section: Separate the two rear sections as needed to access the power cables. Disconnect electrical cables from white receivers and place receivers in Kit 1. Pull electrical cables back into rear section through hole in back of exhibit. Coil cable neatly and secure with Velcro tape to avoid the cable damaging the LED lighting strips. Ease section from exhibit and place in case, with open side on the bottom and curved wall towards the outside of the case, keeping exhibit section level. Gently move exhibit into case.

Second Section: Follow the same steps as for first section. Place case door on and secure.

Installation Tools, Small Exhibit Components, Marketing Tools

Pack the following in the small road case:

- Overhead crossbars (4)
- Electrical connections (2)
- Connecting hardware and tools and spares (Kit 1 and Kit 2)
- Exhibit floor mat (1)
- Exhibit overhead fabric panel (1)
- Anti-static cloth for exhibit and screens
- Remote controls-2 plus 1 spare and extra batteries
- Black non-residue tape

Return Shipping

The BSM will send shipping labels and arrange for a carrier to pick up the exhibit and ship it to its next destination. Place shipping labels on cases and secure them.

Specs

- Height: 90'
- Length: 92'
- Depth: 4' 5"
- Power Source:
- Batteries Needed:
 - Video Remote-2025 3v
 - LED Remote-A23G 12v

The Ribosome

Contacts

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