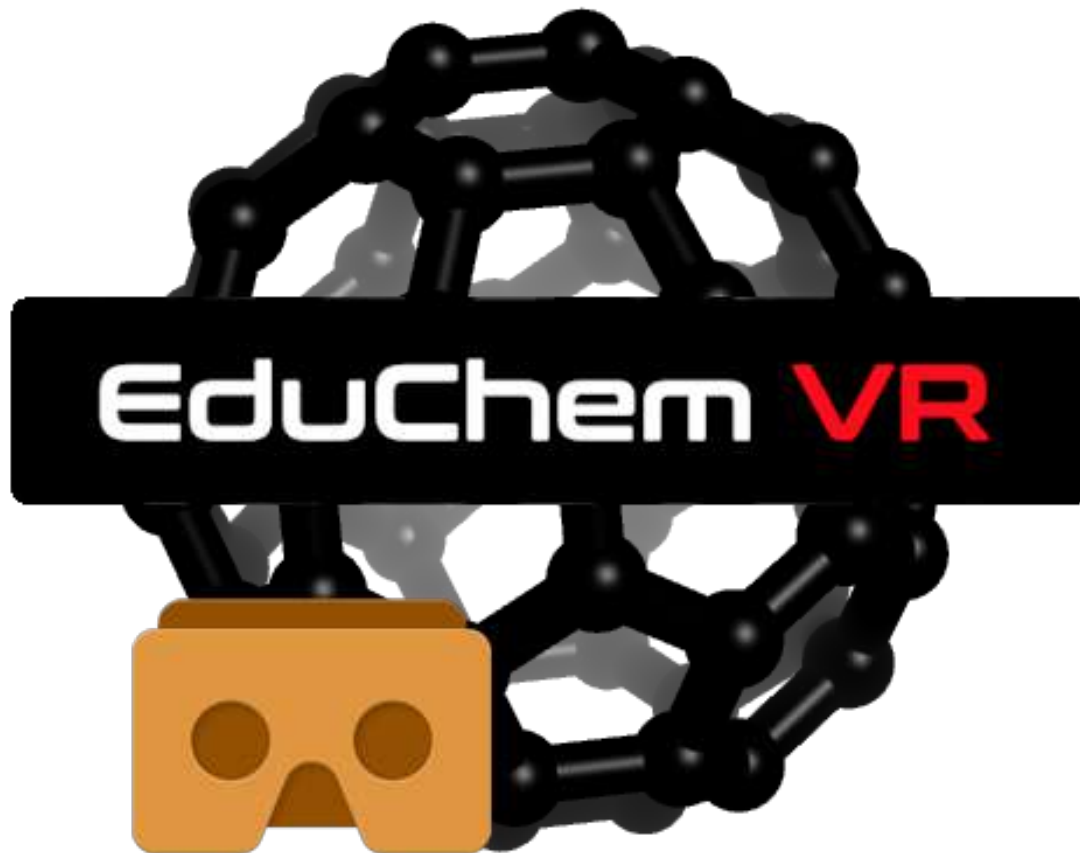


# Improving Chemistry Learning with Virtual Reality



*Nonconfidential company presentation (Nov 21, 2017)*

# Concept

We develop VR content to improve  
Chemistry learning



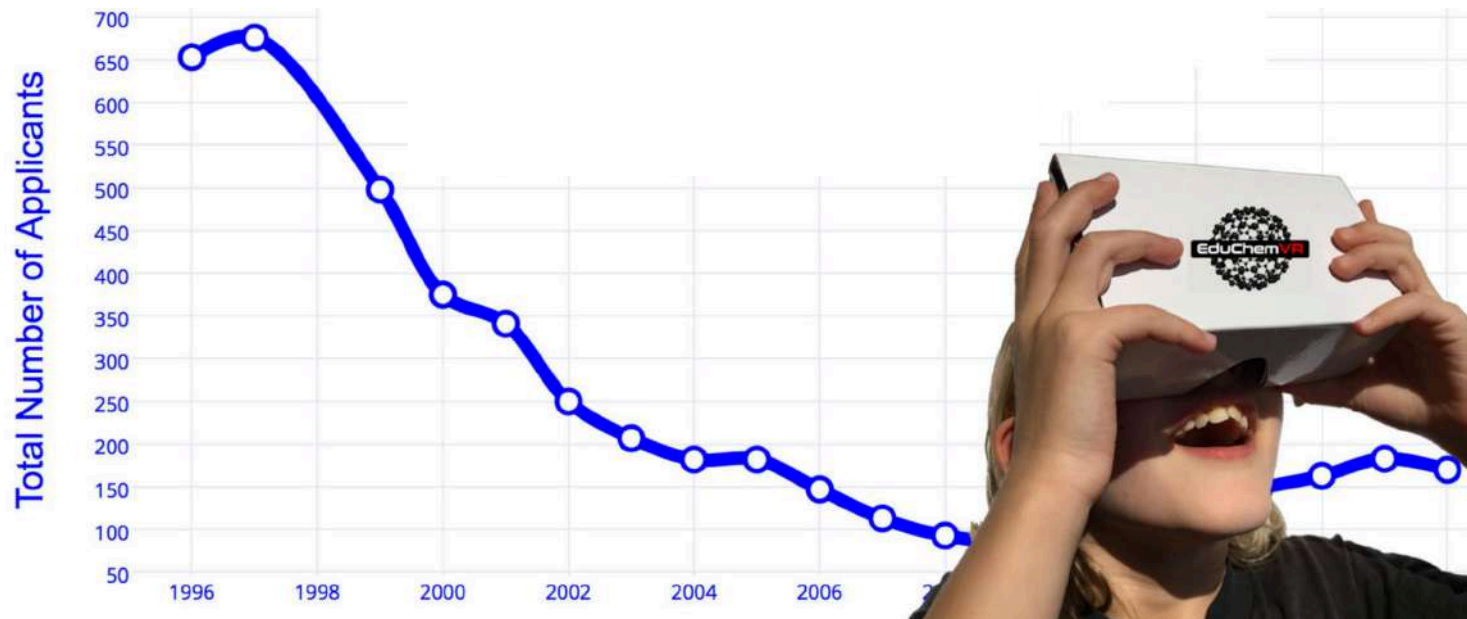
Our vision is to educate and inspire

We believe that easily accessible smartphone VR apps are the  
means to reach anyone anywhere

# Problem

## Chemistry is not seen as an attractive school subject

Leading to a decline in the number of students (and teachers). For example at the University of Gothenburg Chemistry is often considered dull and dry and difficult to understand.



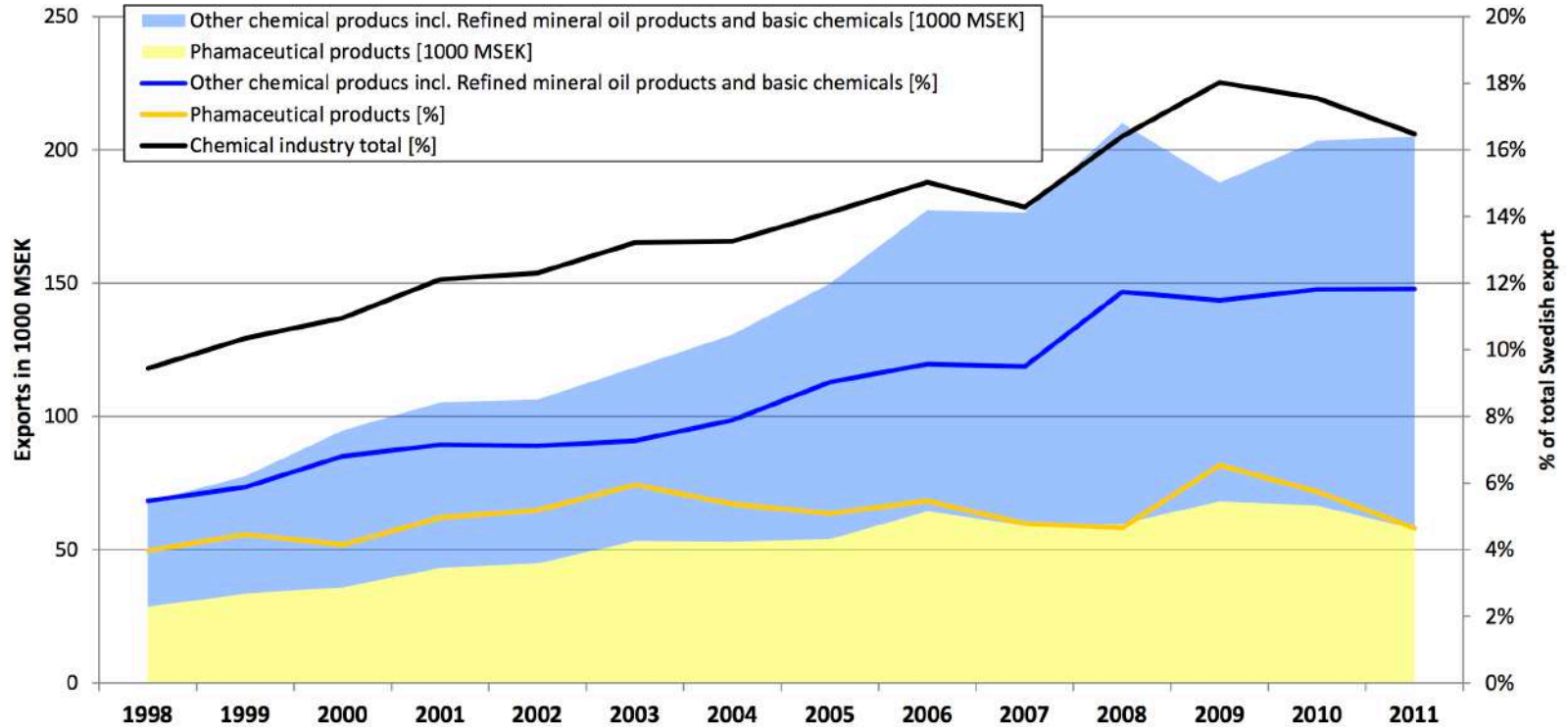
## 2D to 3D: Many struggle with the conceptual transition

All molecules are 3D-objects. A fundamental problem is how to teach, conceptually and practically, students the transition of thinking of molecules as 2D-representations to real 3D-structures. Research shows that spatial thinking is very important for understanding and needs to be trained. VR facilitates such learning, especially for students with lower spatial ability.

# Impact

## Chemistry skills are needed in many, many areas

To treat disease, environmental issues, develop new materials, within cosmetics, cleaning and petroleum refining, etc..)



16% of Swedens export (2011) comes from the chemistry industry  
(VINNOVA Analysis VA 2013:01 "[Chemical Industry Companies in Sweden](#)")

The Chemistry industry report difficulties in recruiting

# Mobile First

With recent advances in VR technology we can deploy on everyone's favorite tool: your smartphone

There are over two billion smartphones in use globally  
EduChem VR can basically reach anyone, anywhere



Google Cardboards: 1-20 USD



Samsung GearVR: 50-150 USD

Our approach is accessible, inexpensive and easy-to-use  
thus attending to ["The biggest barrier \[for using tech/VR in schools\] is definitely access"](#)

A recent survey reveals that [83% of teachers](#) wants easy-to-use VR in school



# Virtual Reality

*comes with an inherent wow factor!*

the VR market is expected to be huge:  
an \$80 billion market in [2025 according to Forbes \(2016\)](#):

## VR – the technology is becoming mature

- Gartner hype cycle: VR has reached the plateau of productivity, and approaching mainstream adoption.

## VR – great for understanding abstract concepts

- The Labster life science company demonstrated improved learning outcomes (76% higher scores) compared with traditional teaching ([Bonde et al. Nature Biotechnology, 2014](#)).

## VR – ideal for learning and educational purposes

- Research has shown that when you put a person in a place, they are more likely to remember it – retention of knowledge. It's great for engagement.

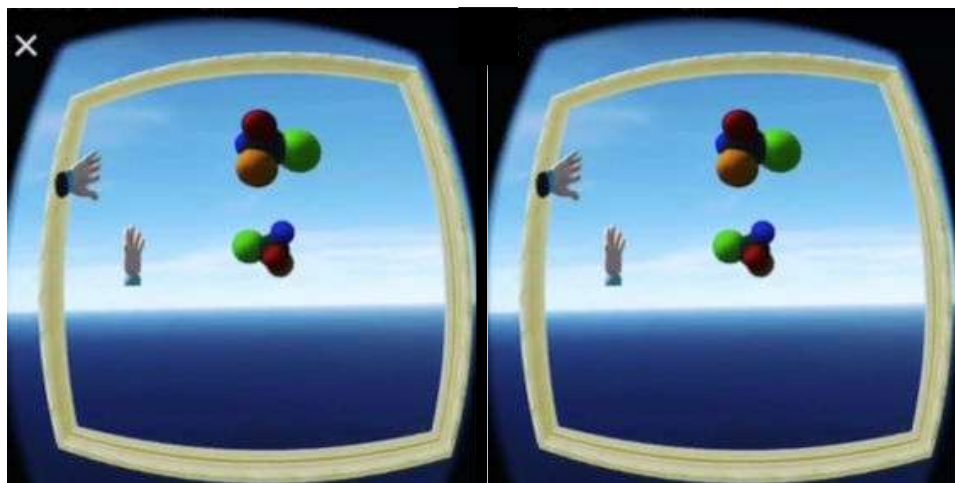
## VR – more efficient than traditional tools

- *“It can take a day to set up an exercise using traditional physical molecular models. With EduChem VR apps this is instant”* Ass Prof. C-J Wallentin, University of Gothenburg

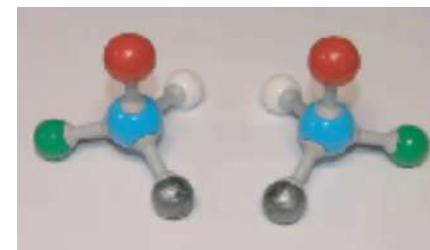
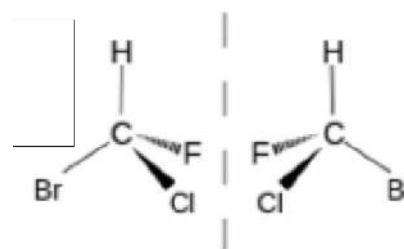
# Use-Case

Compare explaining the importance of stereochemistry

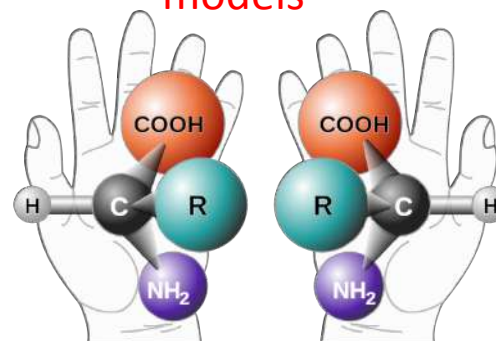
with VR scenes



and traditional teaching



using pen&paper/whiteboard/physical models



We believe and aim to show that Virtual Reality experience is a more efficient and better as a learning tool.

# Products

Three freemium virtual reality Chemistry apps available

one to explore different carbons forms, one to explain the difficult concept of stereochemistry, and one to explore macromolecular structures – by going on a DNA roller-coaster!

1. 	2. 	3. 
<a href="#">Learning Carbons VR</a>	<a href="#">Learning MacroMols VR</a>	<a href="#">Learning StereoChemistr...</a>



**Just released! “Chemistry VR” on Oculus Store for Gear VR**



# Monetization

## 1. Freemium mobile apps

Three apps for Android and iOS ('Learning Carbons VR', 'Learning MacroMol VR' and 'Learning StereoChem VR') have been released.

Downloaded in >50 countries.

## 2. Tailor-made VR apps

*Developed on demand for Science Centers. All major VR platforms supported*

## 3. A comprehensive educational chemistry platform

*Underway. Experience and learn about important concepts like atom orbitals, hybridization, stereochemistry and molecular geometries, all in interactive VR. The target is University level, but also high-schools. Available on WebVR and GearVR.*

## 4. Consulting

*We support, installation, maintenance and further development of enterprise version "[Molecular Rift v2](#)"*

*\* Note that we do not necessarily restrict ourselves to chemistry education. We are open for other areas (physics, math) and models of collaboration. VR apps for PR purposes are feasible already now.*

# External Recognition

Selected as one of the [15 hottest EU start-ups](#).

Listed as winner in "[Startup Europe Micro-Grants](#)"

Selected finalist (top-6) among over 400 apps making the world a better place in the EU [2017 CER Prize](#) competition.

Selected as one out of 15 finalists, among over 4300 ideas, on how to make the world a bit better in the Swedish [Swedbank Rivstart](#) competition.

*A greater mission is to make the world a better place – We like to see ourselves as social entrepreneurs*

# In the press

EduChem VR in big [GP article](#) on the possibilities of chemistry VR.



Listed as a Swedish VR company to keep an eye on by [NyTeknik](#)

Highlighted in the financial magazine "Veckans Affärer"

Front cover in "[The Medicine Maker](#)"

Camilla Cars, 2016	Spårvärd	Stockholm	Kombinera motionscykel med vr-upplevelse.
Carry Castle, 2016	Dataspel	Torslanda	Tvåmannastudio som satsar på vr-spel.
CLVR Works, 2016	Media, 360-produktion	Göteborg	Visar konserter i virtual reality.
Cortopia Studios, 2016	Dataspel	Stockholm	Ligger bakom prisbelönta spelet Wands.
Crunchfish, 2010	Programvara	Malmö	Utvecklar programvara för gästbaserade gränssnitt.
Diakrit, 1995	Fästighetsbranschen	Stockholm	3d-visualiseringsprodukter för fastighetsbranschen.
Diverse Industri	Diverse industrier	Malmö	Vr-upplevelser åt industriföretag.
Sleeplyon Studios, 2006	Programvara	Linköping	3d-optimering, ägs numera av Microsoft.
DVA, 2017	Marknadsföring	Stockholm	Vr- och ar-upplevelser.
EduChem VR, 2016	Utbildning	Göteborg	Vr-upplevelser för kemistudenter.
Enterspace VR, 2015	Idrottsutrustning	Stockholm	Vr-upplevelsecenter i Stockholm. Nyligen köpta av Starbreeze.
Eyomade, 2014	Hårdvara	Kalmar	Vikbart vr-headset. Gjorde succé på Kickstarter.
Faet Travel Games, 2016	Dataspel	Stockholm	Före detta Rovio-chefen Oskar Burmans nya spelbolag.
Gleechi, 2014	Programvara	Stockholm	Utvecklar programvara för gästbaserad kontroll i vr-miljöer.
Gobrilla, 2014	Konsult	Stockholm	It-konsult med ett ben i vr-världen.
Hatrabbit, 2016	Dataspel	Stockholm	Snöbollssing i vr med spelet Merry Snowballs.
Hoylu, 2016	Produktivitet	Malmö	Utvecklar en plattform för teamwork och produktivitet.
IBRSV, 2015	Hjärtvår, programvara	Stockholm	Innovationshus som utvecklar hårdvara och programvara för interaktiva berättelser.
Ivar, 2016	Media, 360-produktion	Stockholm	Speliet Cloudborn där man både får klättra och hoppa i vr.
Loftown Studios, 2016	Dataspel	Stockholm	Har redan hunnit utveckla flera vr-spel.
Lone Hero Studios, 2016	Dataspel	Skövde	Skapar en vr-miljö för bland annat språkinläring.
Ljvryd, 2016	Utbildning	Växjö	Vr och ar för byrå- och tillverkningsindustri.
Magisty, 2010	Bergbranschen	Malmö	
Nanonote, 2016			



# Pilots

We are currently running a pilot together with a team from Umeå University, evaluating and comparing our VR with traditional teaching.

We also see great opportunities for VR in lower grades – where the main aim is to raise engagement/interest

*Get in contact with us if you're interested in being part of a pilot*

# Technology

Unity – a multiplatform game-engine is used for development

- We can build and deploy across all major VR platforms.

Native support is available for a wide range of VR platforms:

- Google Cardboard, Samsung Gear VR, Oculus Rift, Playstation VR, Steam VR/Vive and Google Daydream.

Fully automatic process to render all molecular objects (atom, bonds, ect) from x,y,z-coordinates

- using any standard file type

**News! We also develop for WebVR using A-Frame**

# The Team



## EduChem VR

founded September 2016 by

### ***Dr. Jonas Boström, CEO***

*Principal Scientist and Associate Professor*

*Drug designer in Big Pharma for +15yrs*

*50+ articles and patents. On [The Power List](#) and recognized as Top-100 of most influential people in Pharma*

### ***Magnus Norrby, CTO***

*Professional programmer in Finance*

*Main developer of open-source Molecular Rift*

*Domain knowledge in virtual reality and cheminformatics*

***We have been working together almost a decade!***

*The EduChem VR board includes senior scientists:  
a professor in Biology and a professor in Chemistry*

# Details

**Full Company Name:** EduChem VR Sweden AB

## Contact

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**Organisation number:** 559075-6002

**Bankgiro:** 5003-1015042

**IBAN:** SE3450000000050033329095

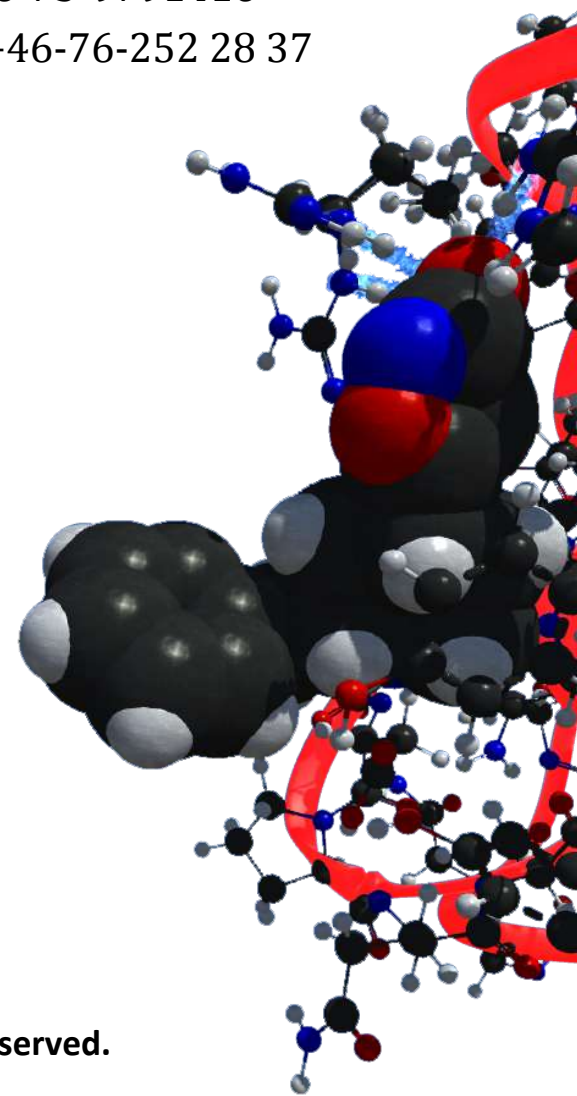
## Social media

webpage: <http://educhem-vr.com/>

Twitter: <https://twitter.com/EduChemVR>

Facebook: <https://www.facebook.com/EduChemVR/>

Instagram: <https://www.instagram.com/educhemvr/>



# Fun Fact

His Majesty King Carl XVI Gustaf of Sweden, the Crown Princess of Sweden, the Sports Minister of Chile, the Executive Vice President at AstraZeneca and the Head of Business Development at EA Sports have all experienced atoms and molecules using our open-source VR tool.



We now shift focus and turn towards tomorrow's leaders – the school children across the globe