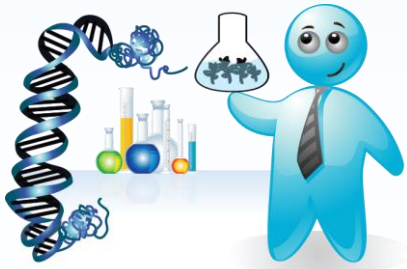
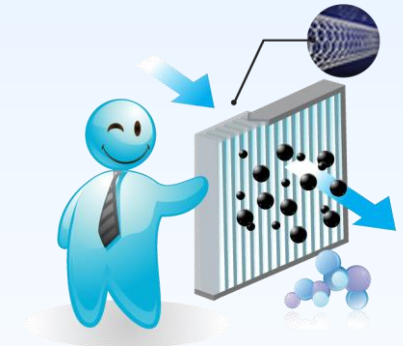
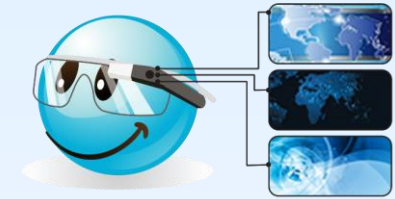
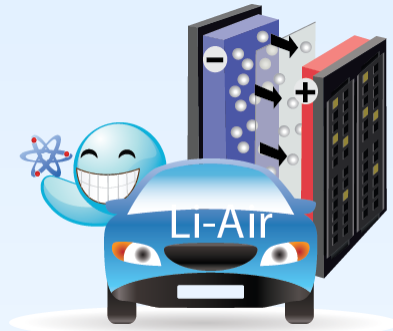


10

Technologies to Watch



Thaweesak Koanantakool, Ph.D.

September 12, 2013



1

Mobile Diagnostic Tools



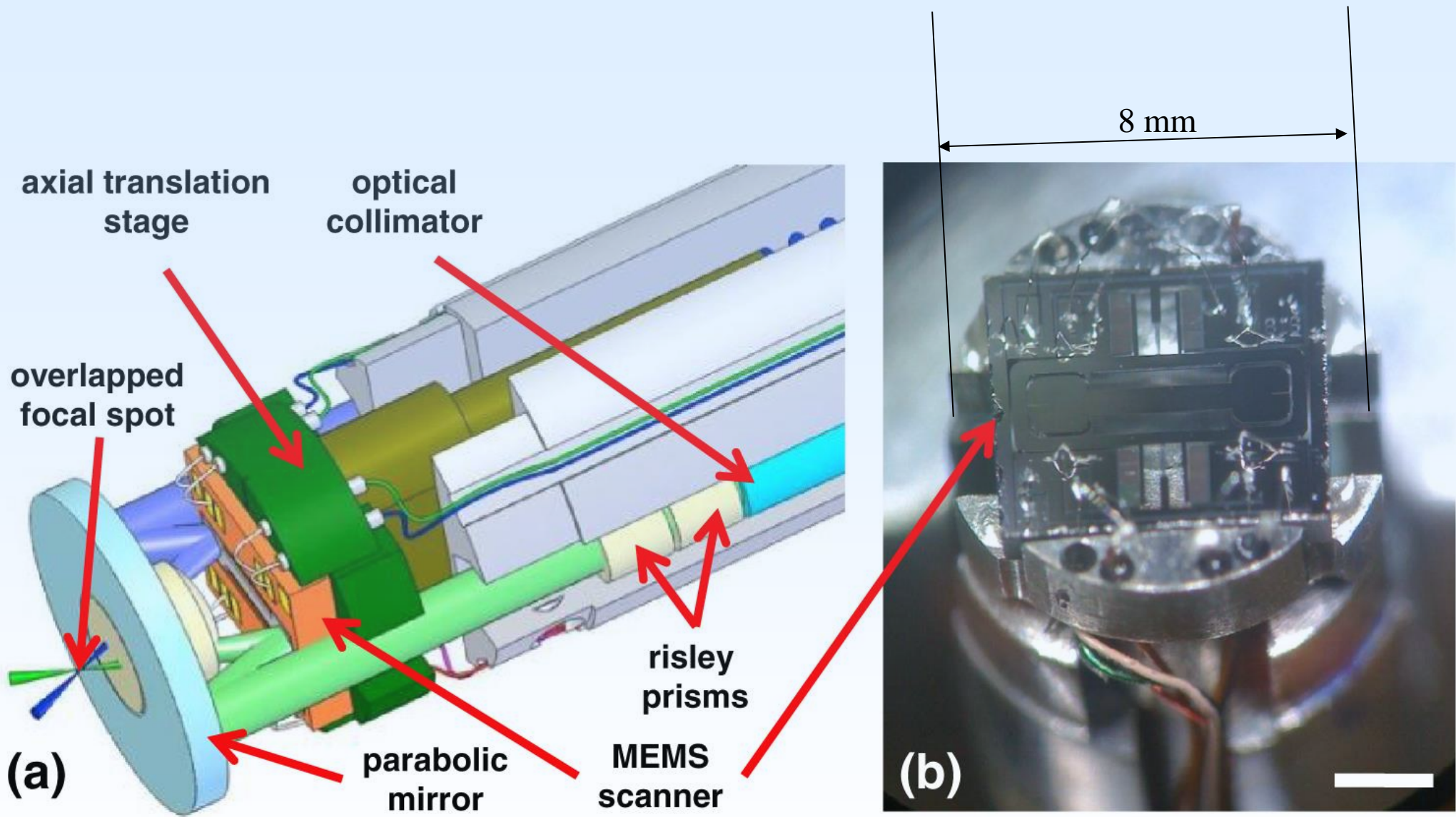
Traditional



Modern







กล้องจิ๋วสำหรับตรวจหามะเร็งระยะเริ่มแรก

2

Nanotheranostics

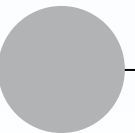


Nanotechnology

Therapy

Diagnostic

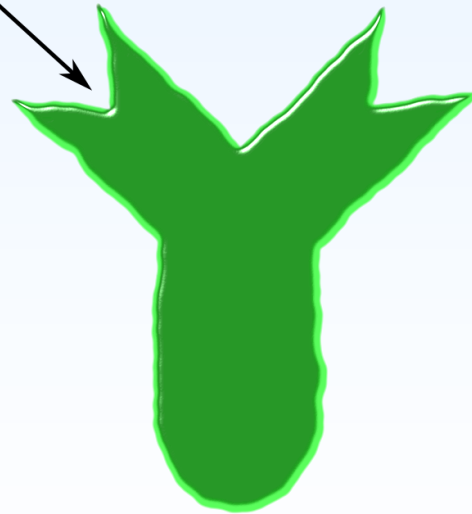
Nanotheranostics





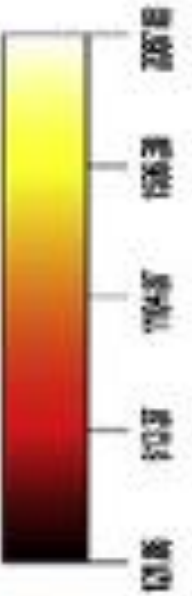
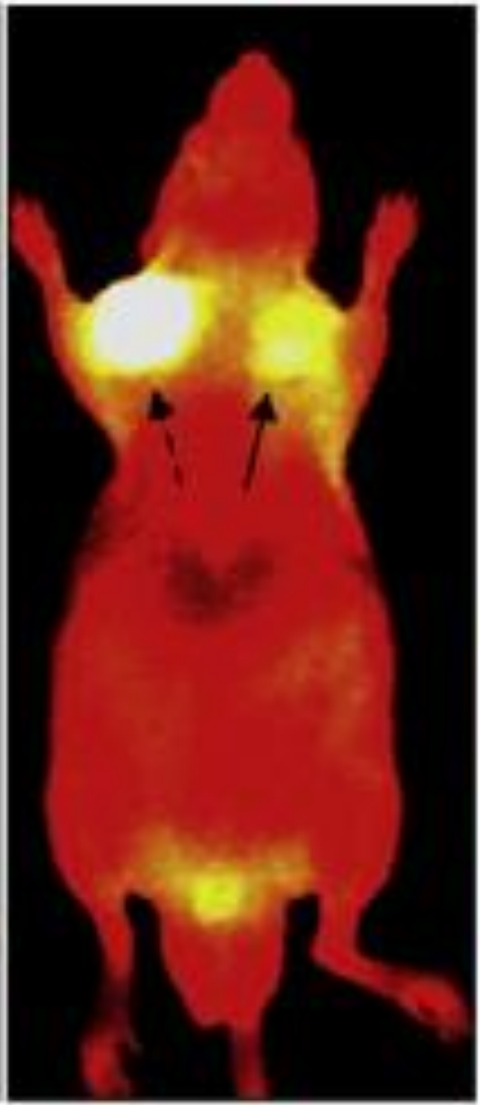
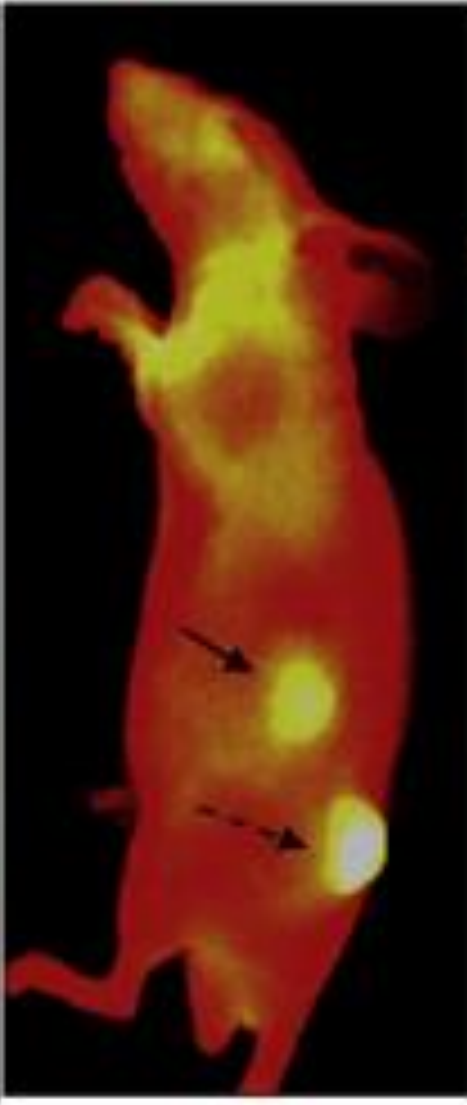
Antigens

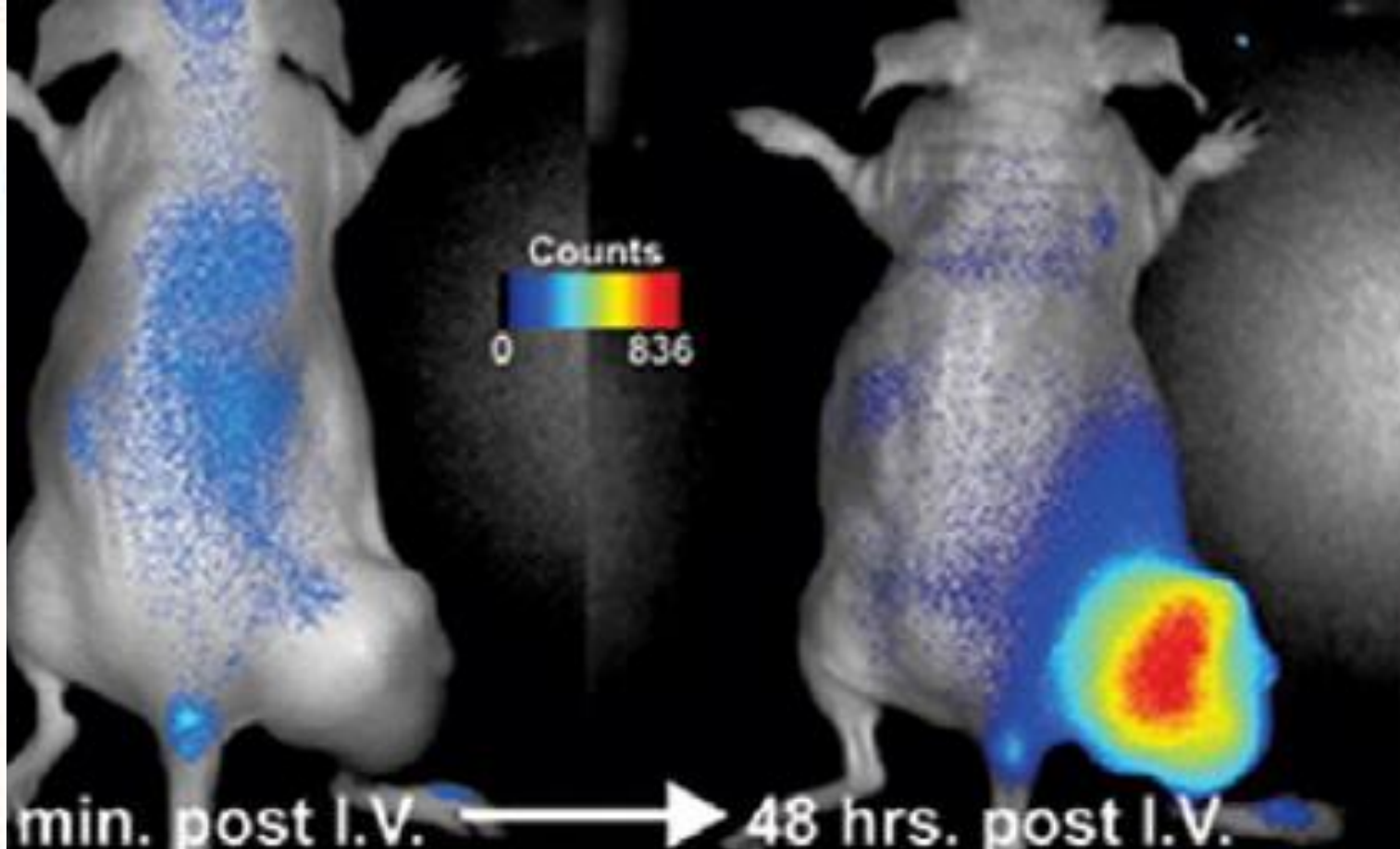
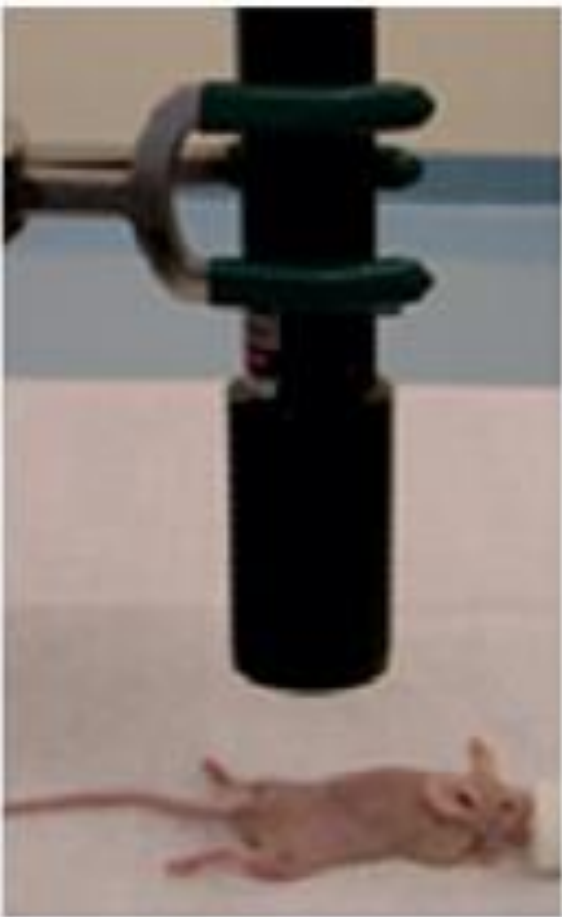
Antigen binding site

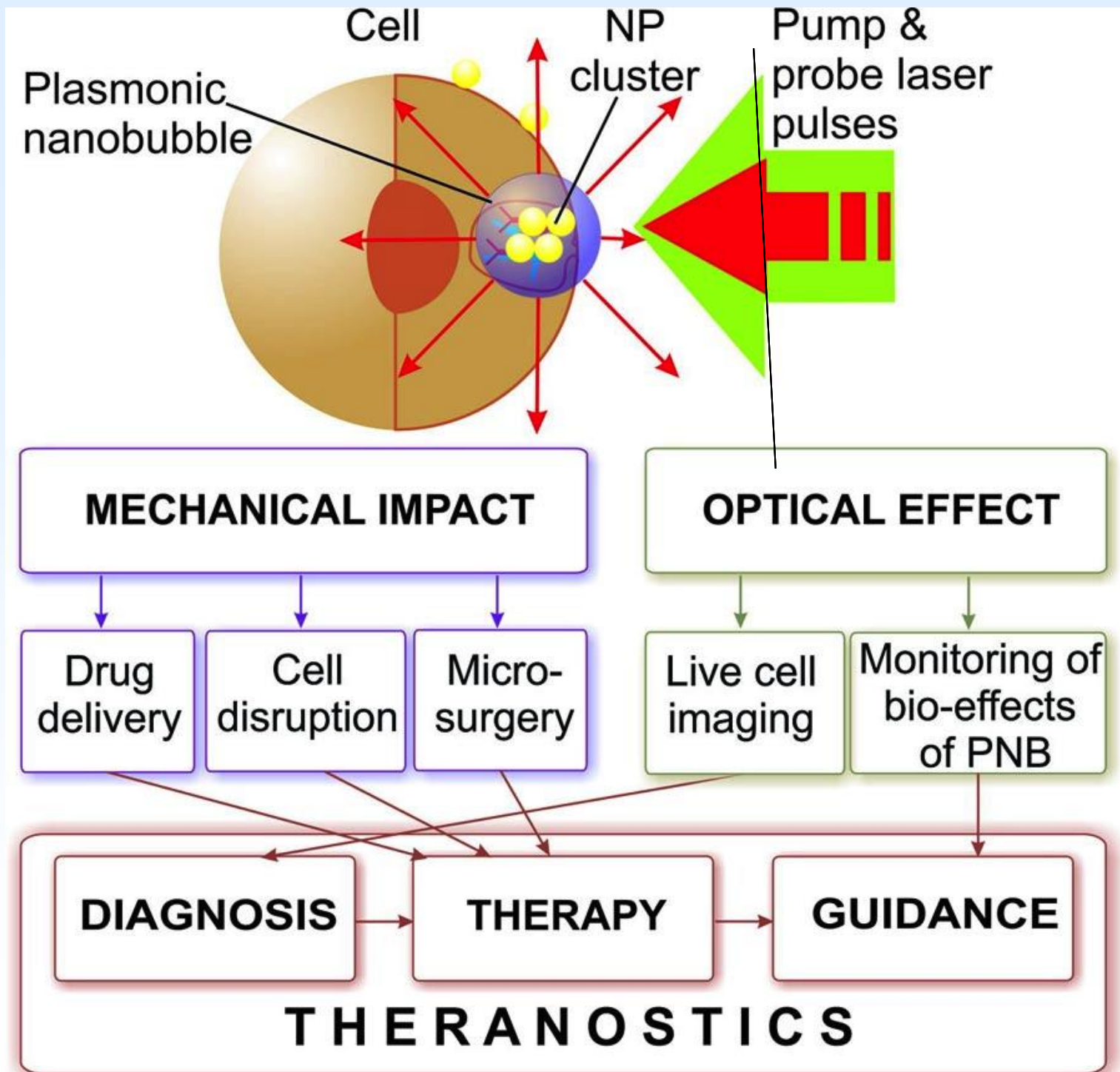


Antibody

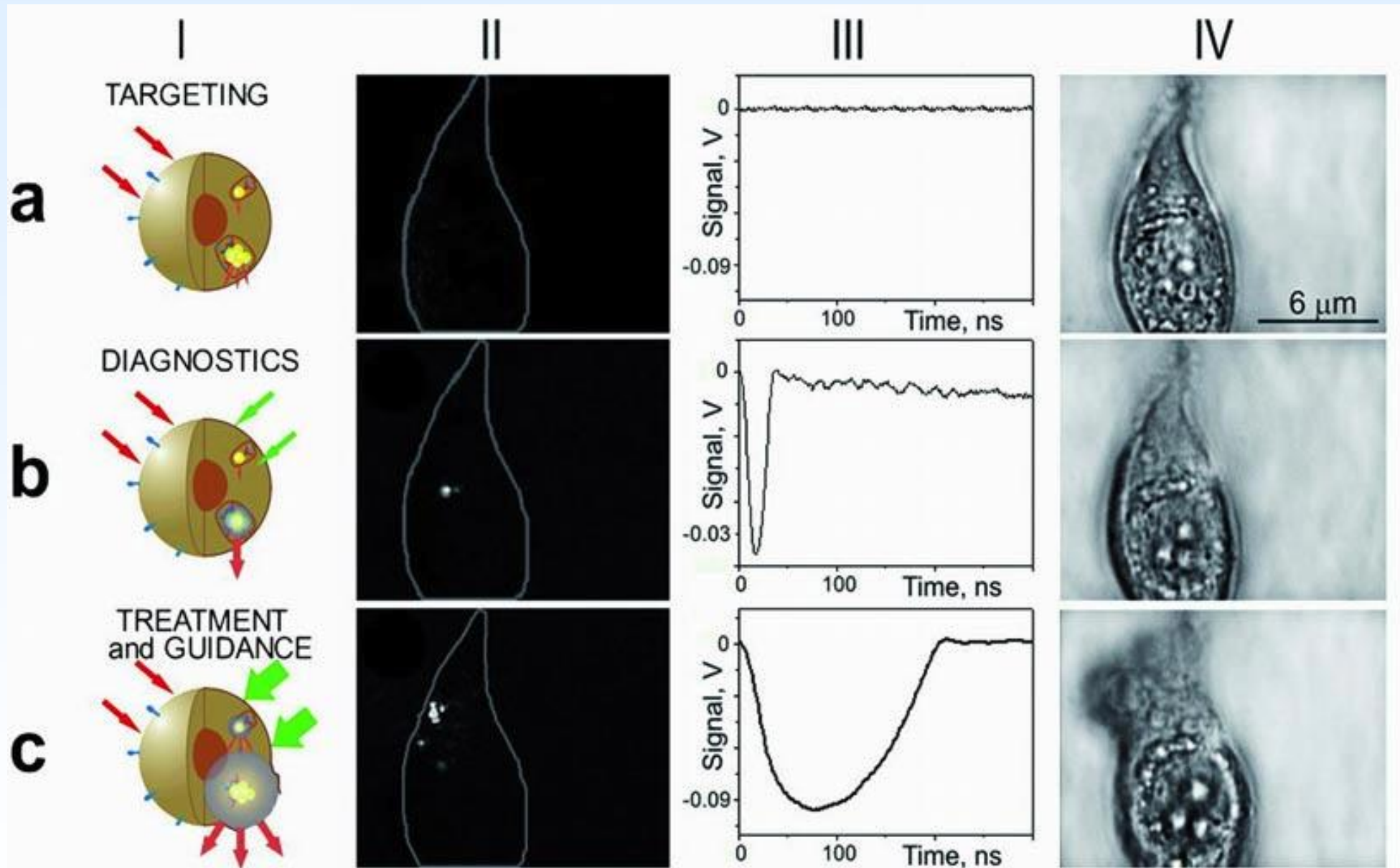
Specific Target





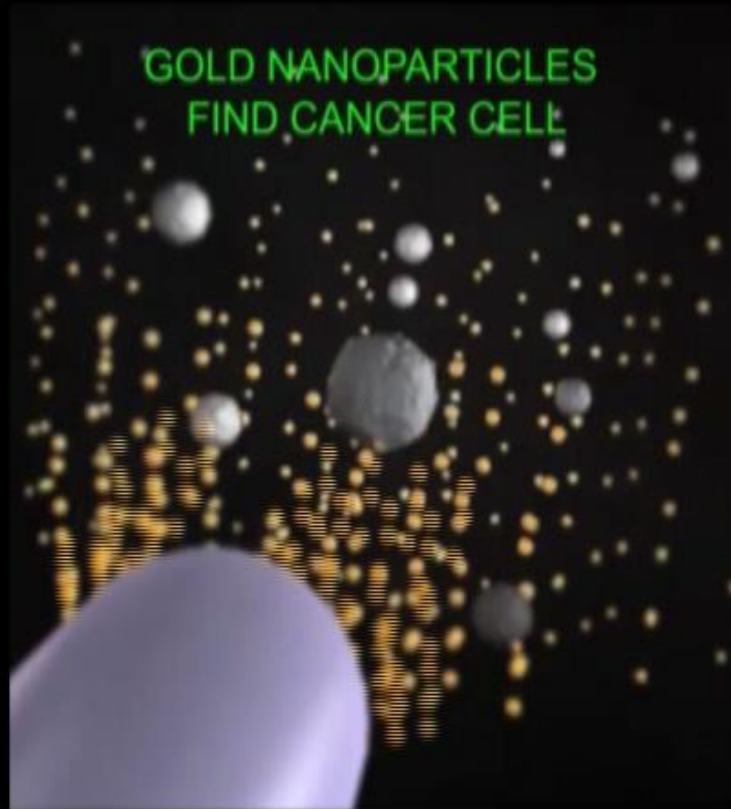


PNB – Plasmonic nanobubbles



ศลิปวิดีโอ

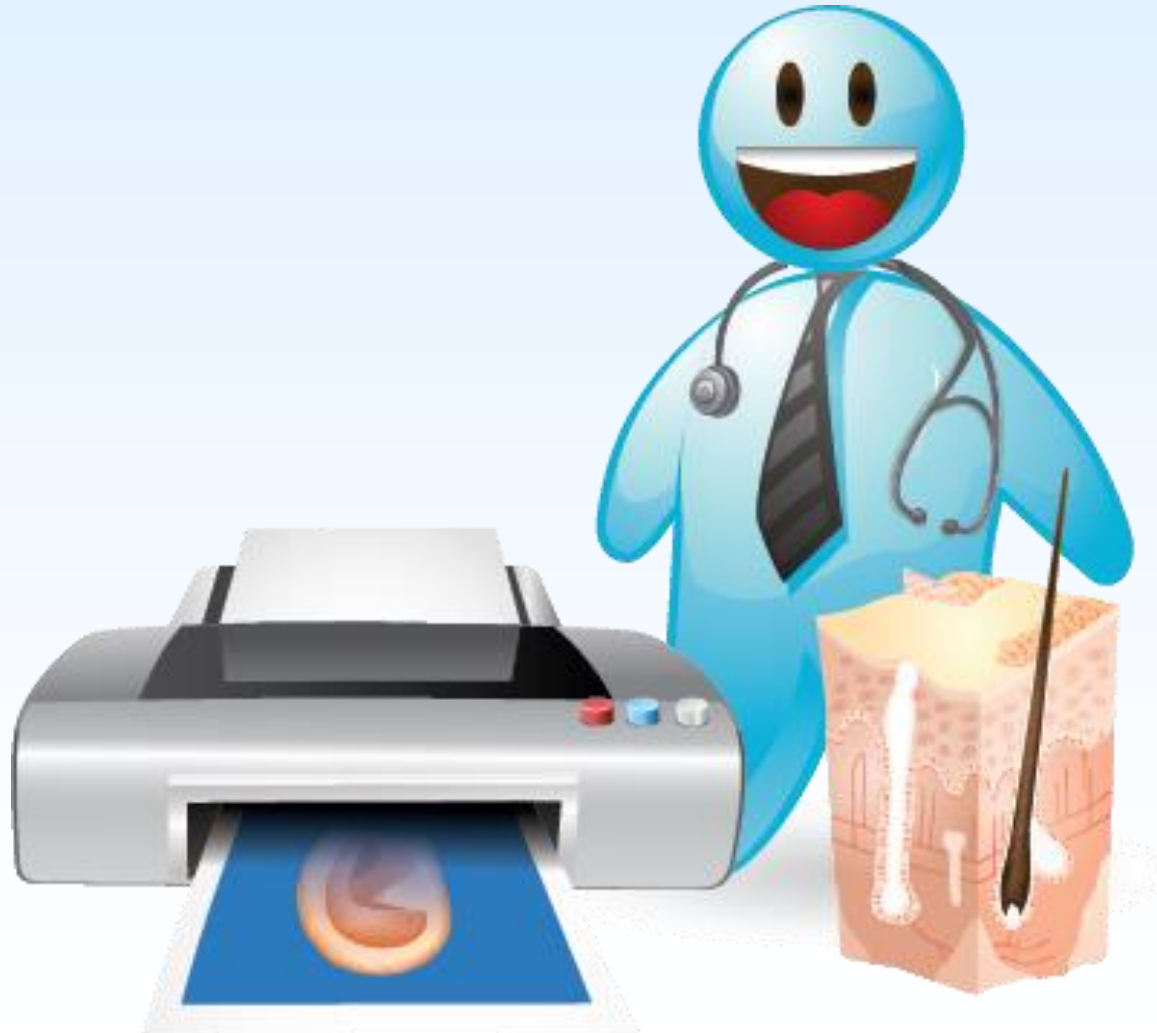
จาก: <http://youtu.be/AUQDyCeQvgk>



<http://www.youtube.com/watch?v=AUQDyCeQvgk>

3

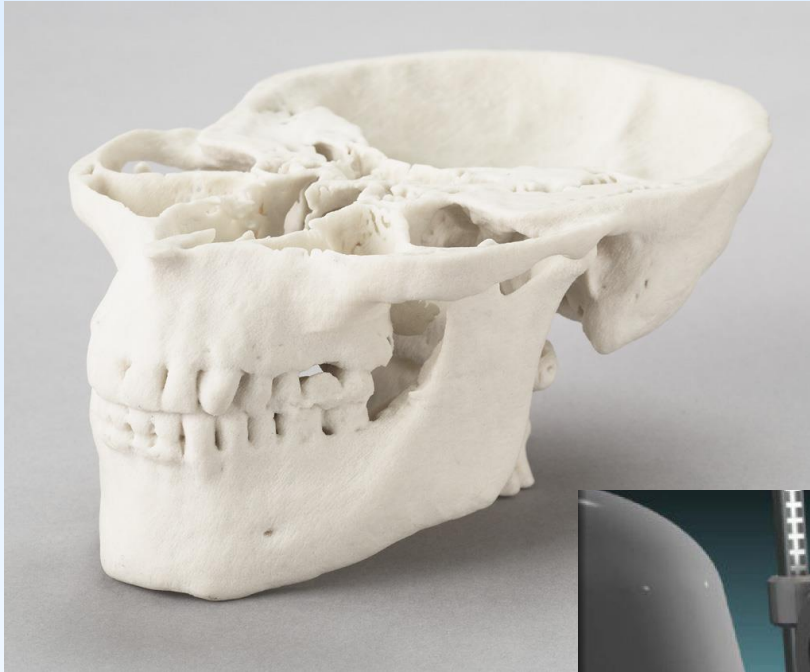
3D Bioprinting



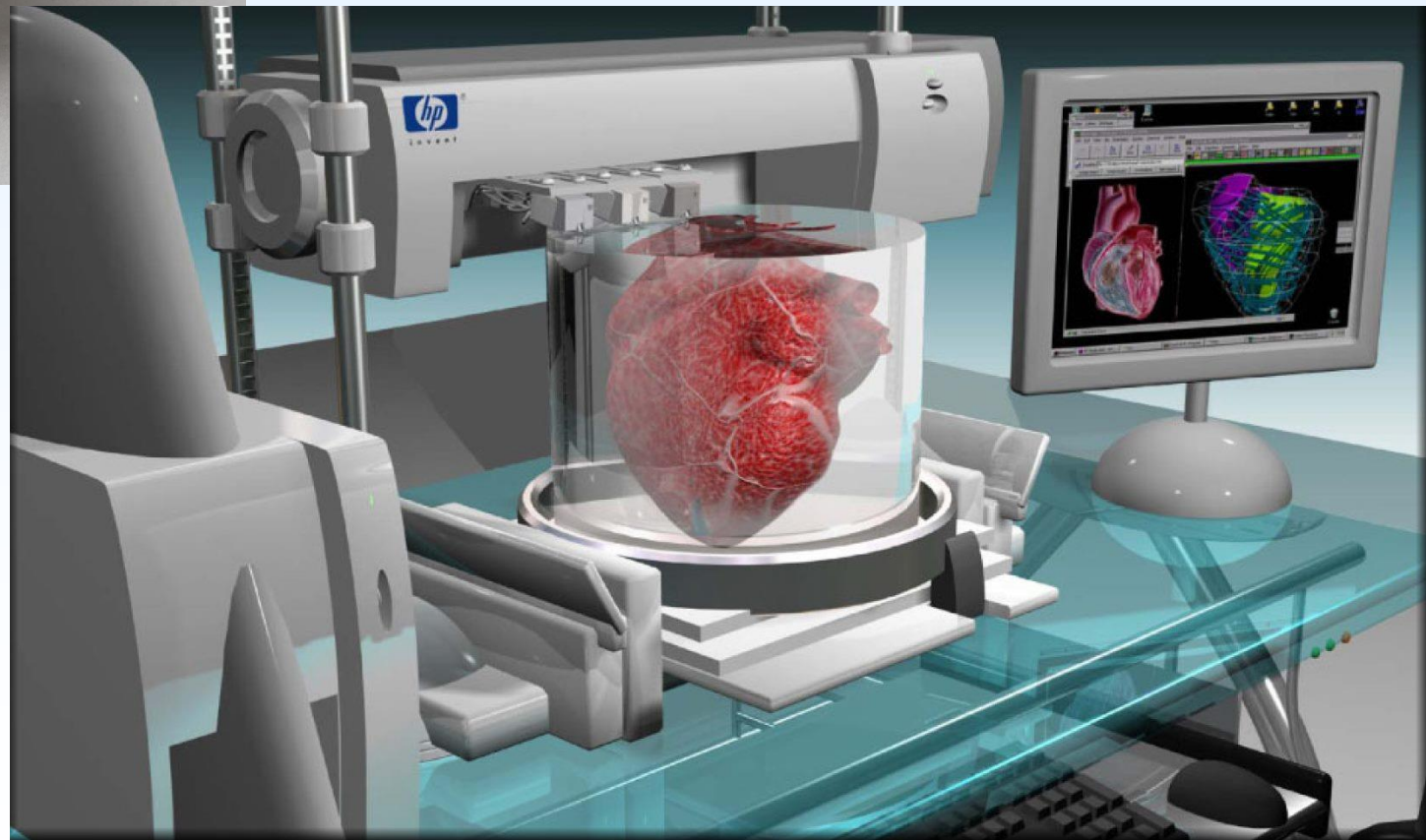
3D Printing – a toy



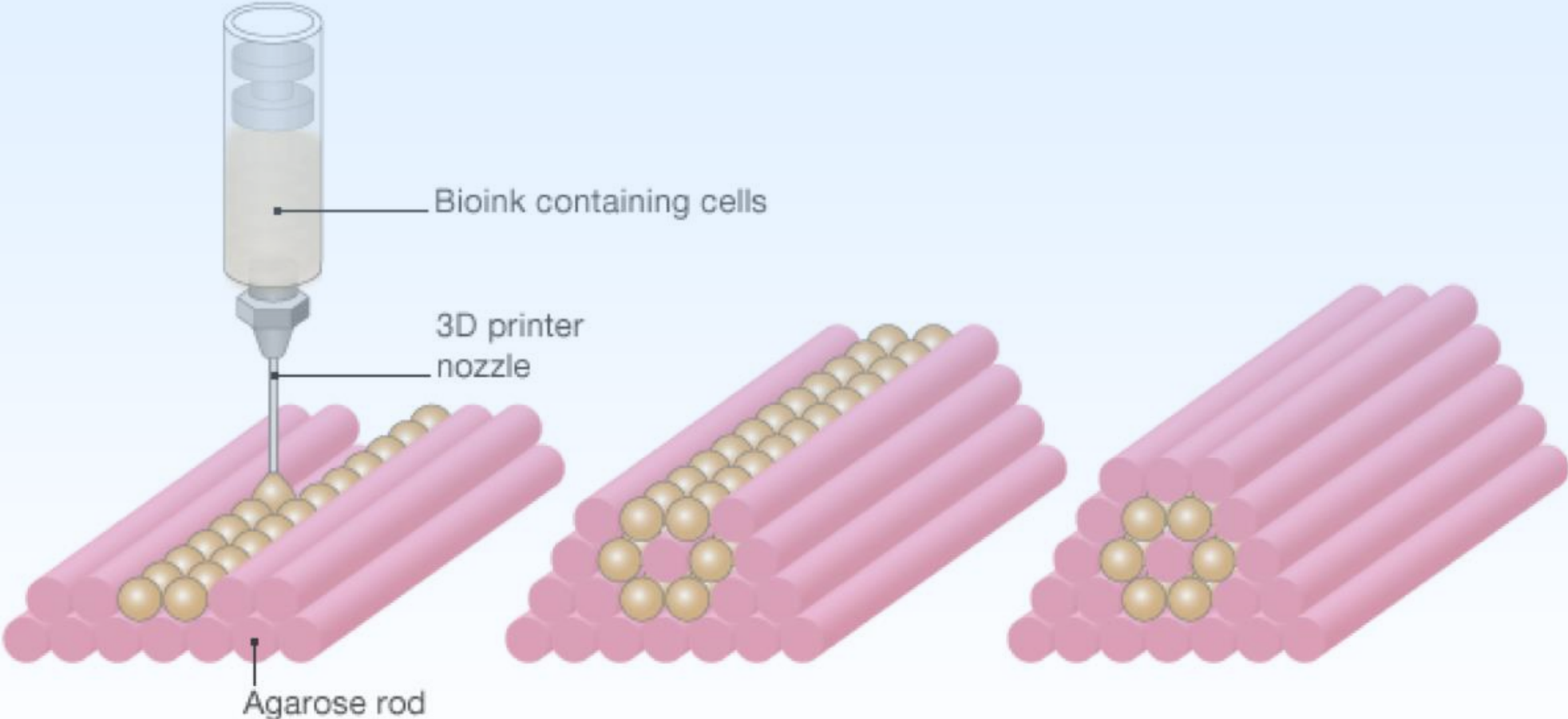
3D Printing - today



3D Bioprinting – a dream



How bioprinting works



Source: Modern Meadow

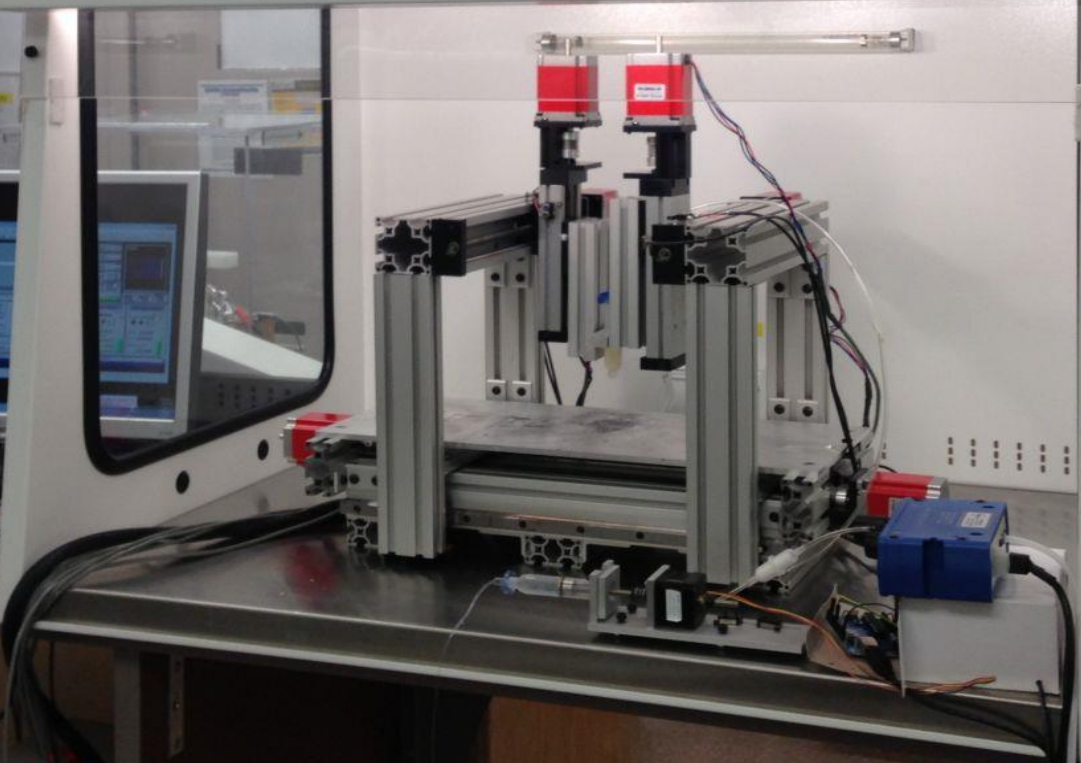
Air Science



Constant Flow Cabinet - PWS Cabinet

Model	LF-100
Flow Rate	100 L/min
Pressure	0.1 bar
Temperature	20°C
Humidity	50%
Filter	HEPA
Power	230V/50Hz
Weight	150kg
Dimensions	1000x1000x1500mm
Accessories	Control Panel, Gauge, Lights

LF-Series

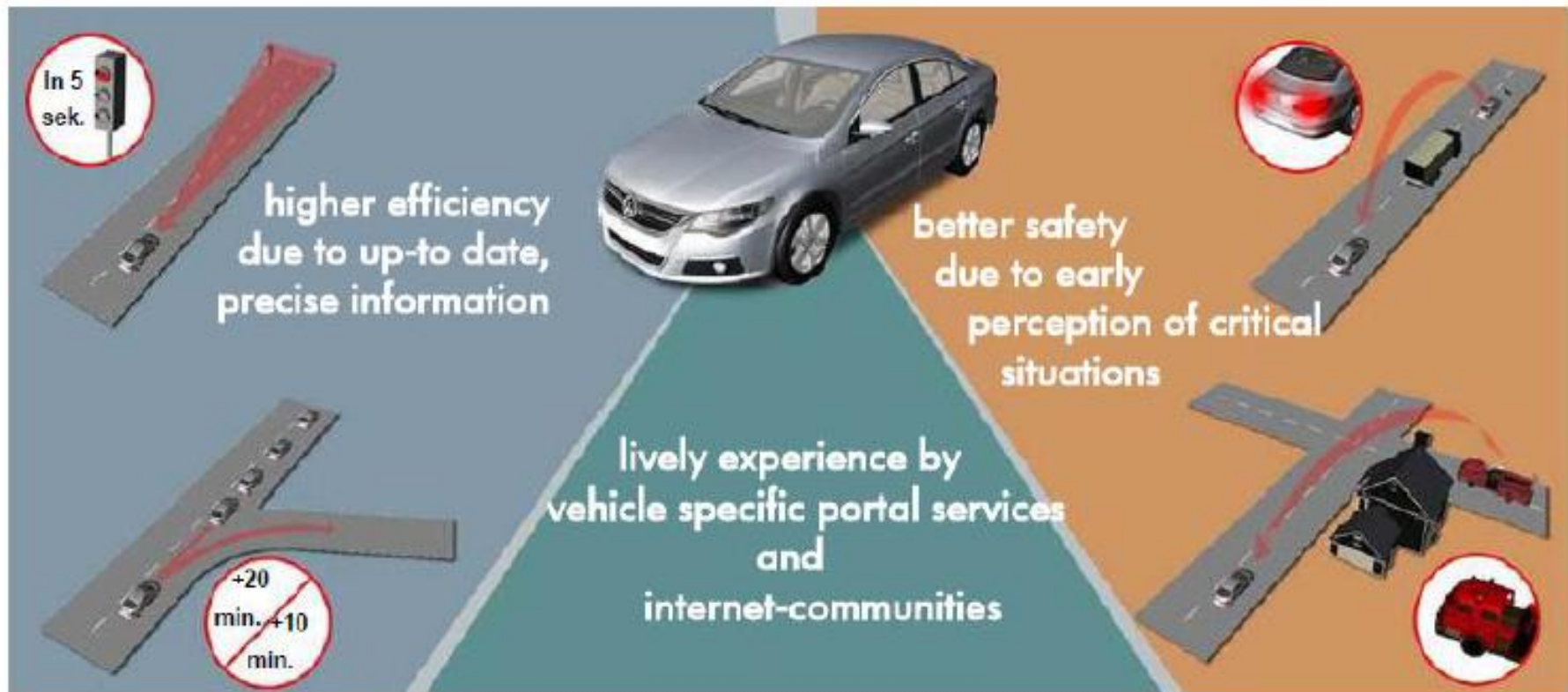


4

V2X



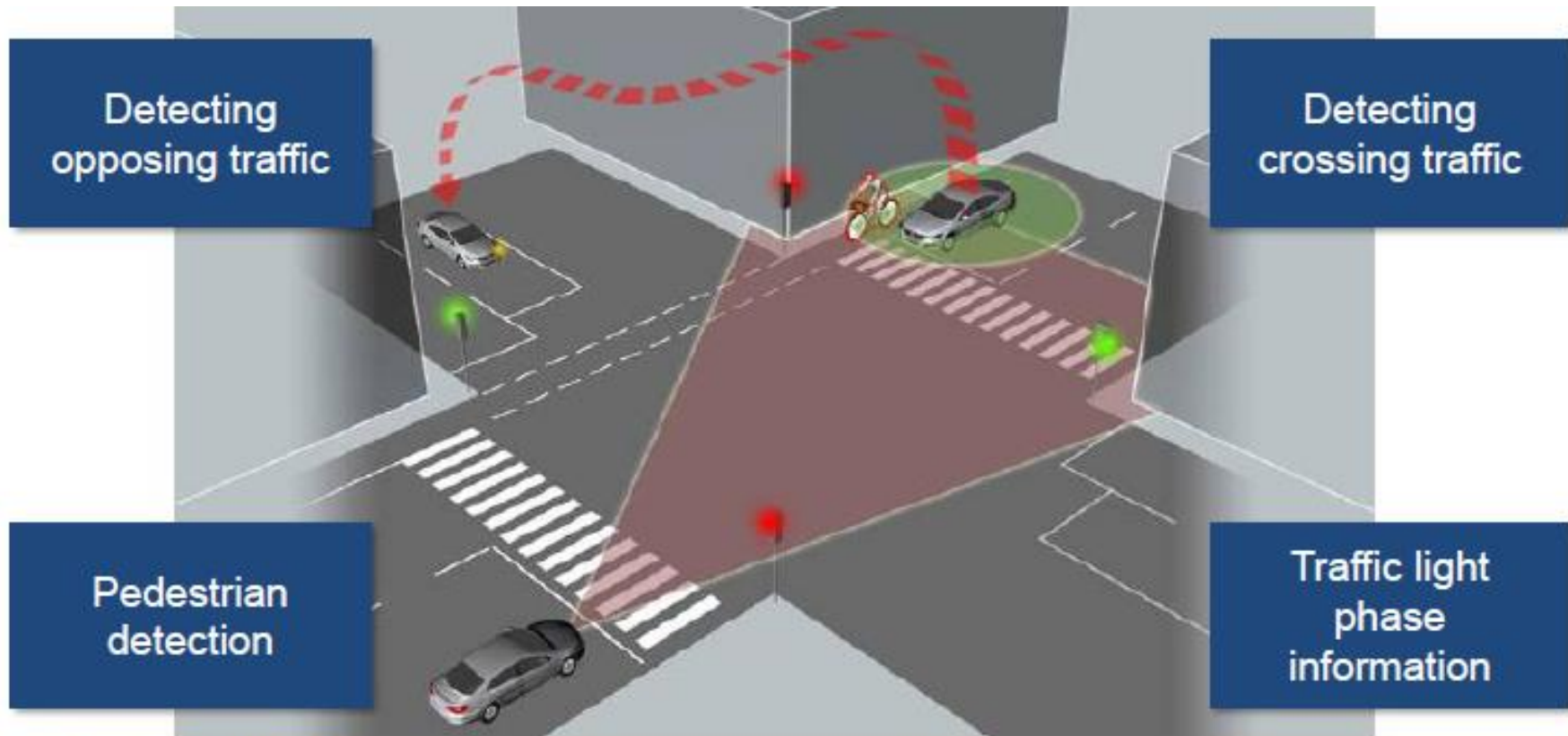
V2V: Vehicle to Vehicle Communication



Integrated Solution:

- Driver Assist Systems could enhance passenger safety at or near the incident sight
- Traffic Incidents could be fed directly into Streaming Traffic data to improve accuracy
- Very short latency (<50ms) for allowing quicker responses

V2I: Vehicle to Infrastructure Communication



Integrated Solution:

- Driver Assist Systems could enhance passenger safety by responding to infrastructure
- Eliminate running of Red Lights, no Turn on Red, Stop signs, etc...

V2X: V2V + V2I

Safety and Services

Information Services



Smart Phones



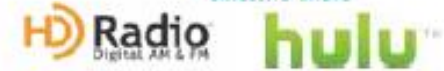
Emergency Services



Navigation



Entertainment



Integration Enablers



Street Sign Recognition



Connectivity Module



Driver Assist

Lane Departure Warning

Follow-to-Stop

Emergency Braking

Heading Control Assist

Park Distance Control

Active Cruise Control

Driver Alertness

Optical Park Distance Control

Heading Control Assist

Accident Avoidance

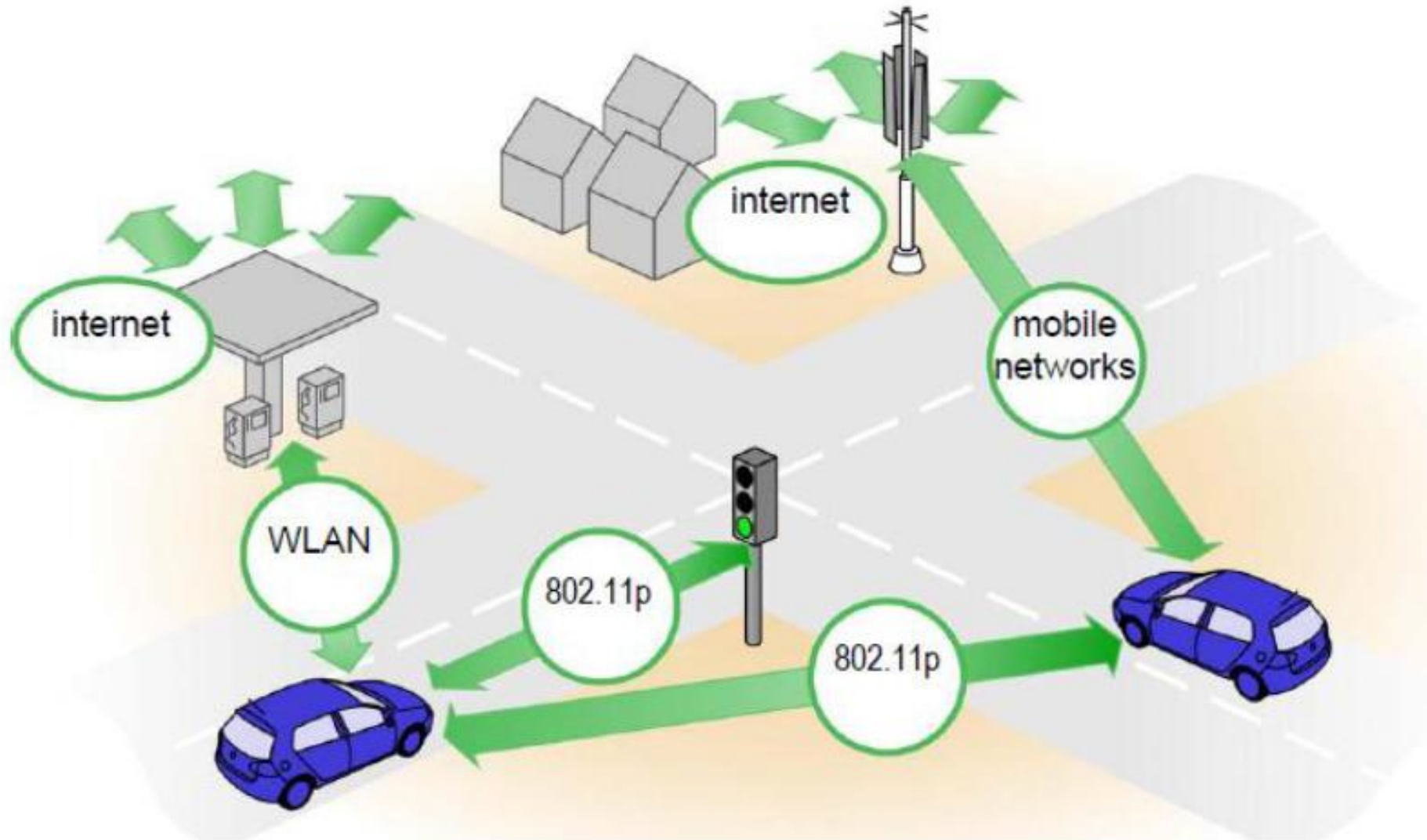
Park Steering Assistance

Side Assist/Blind Spot Detection

Distance Braking Control

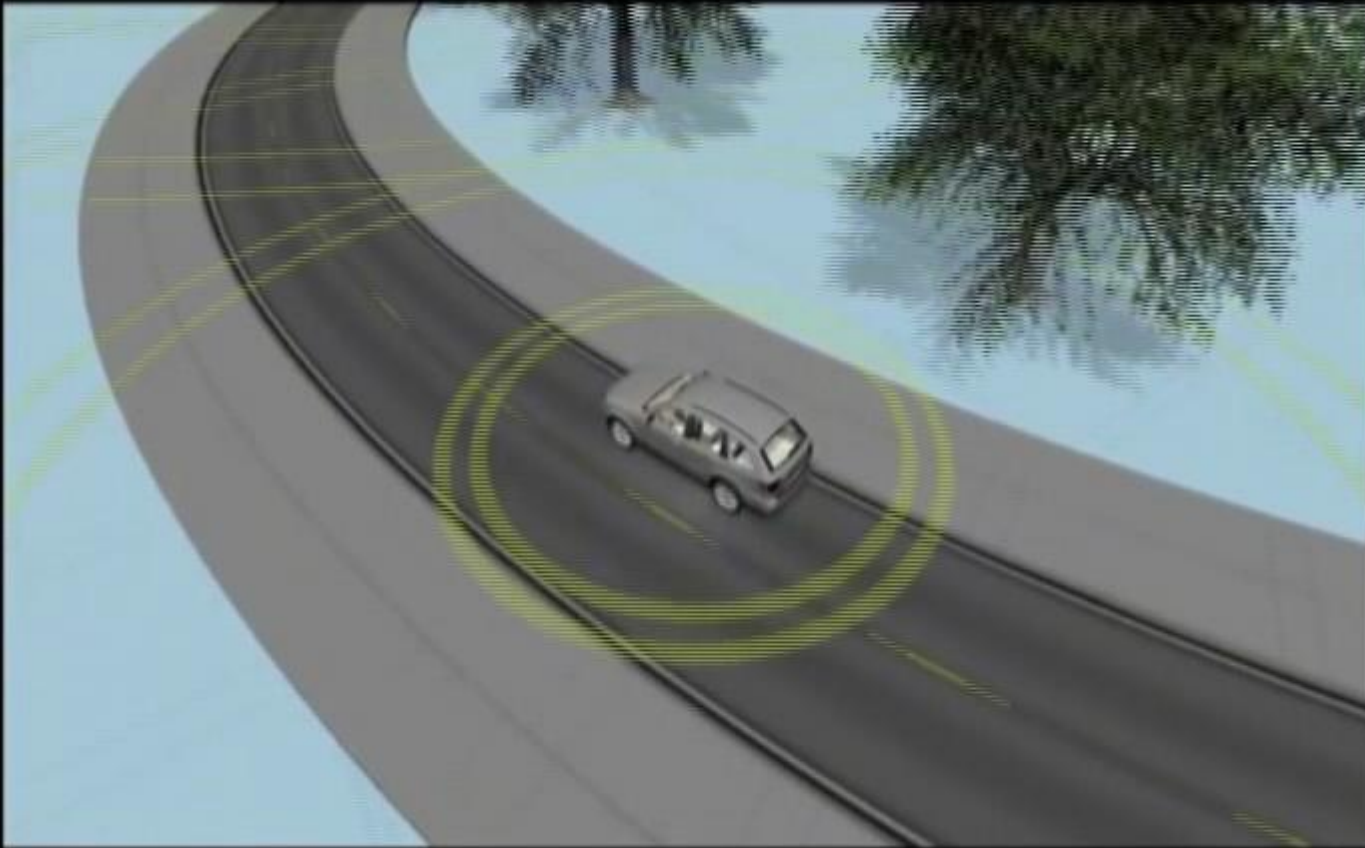


Wireless Access in Vehicle Environment



802.11p - WAVE Protocol

VOLKSWAGEN
GROUP OF AMERICA



<http://www.youtube.com/watch?v=vU4eI3xsZA4>

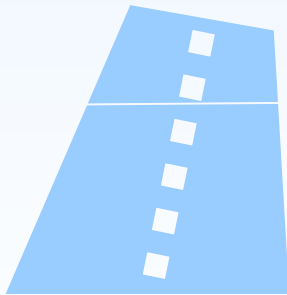
5

Battery for EV

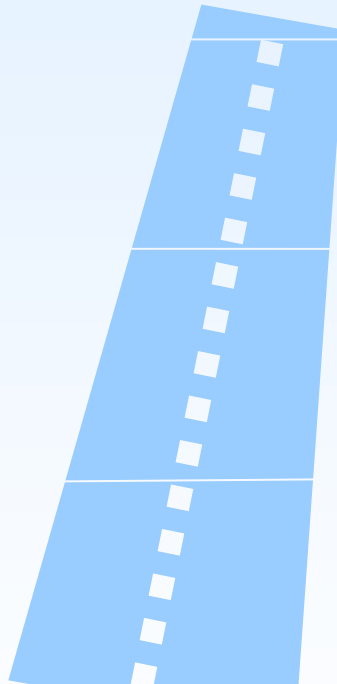


Driving Ranges

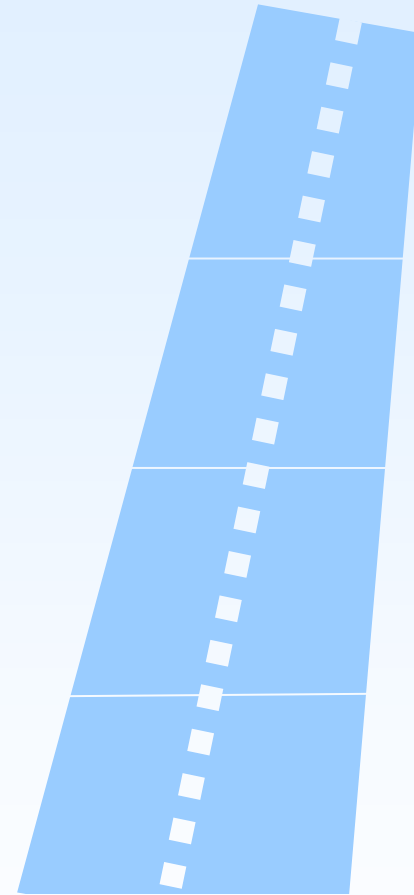
Li-ion
175 km

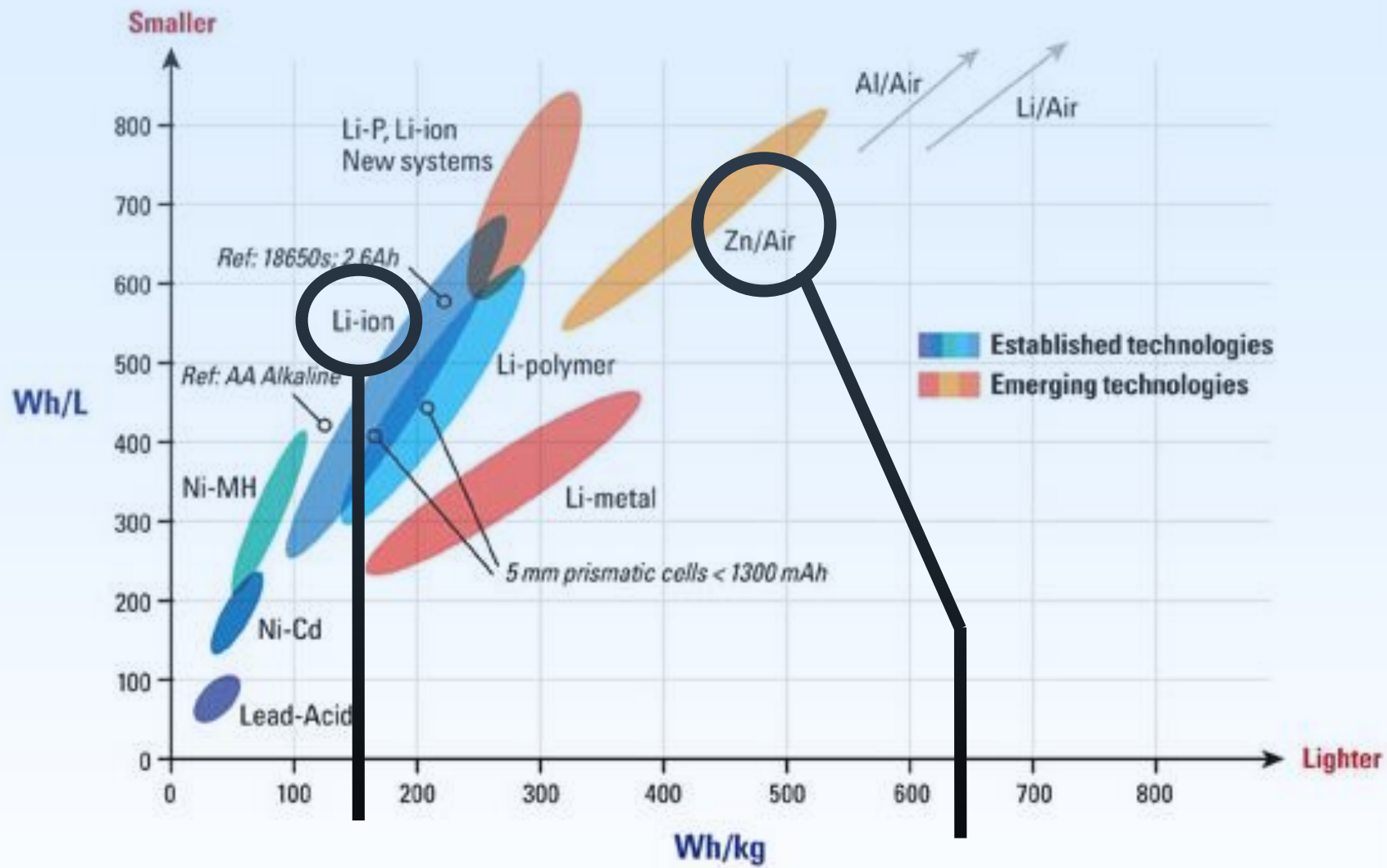


Zn/Air
480 km



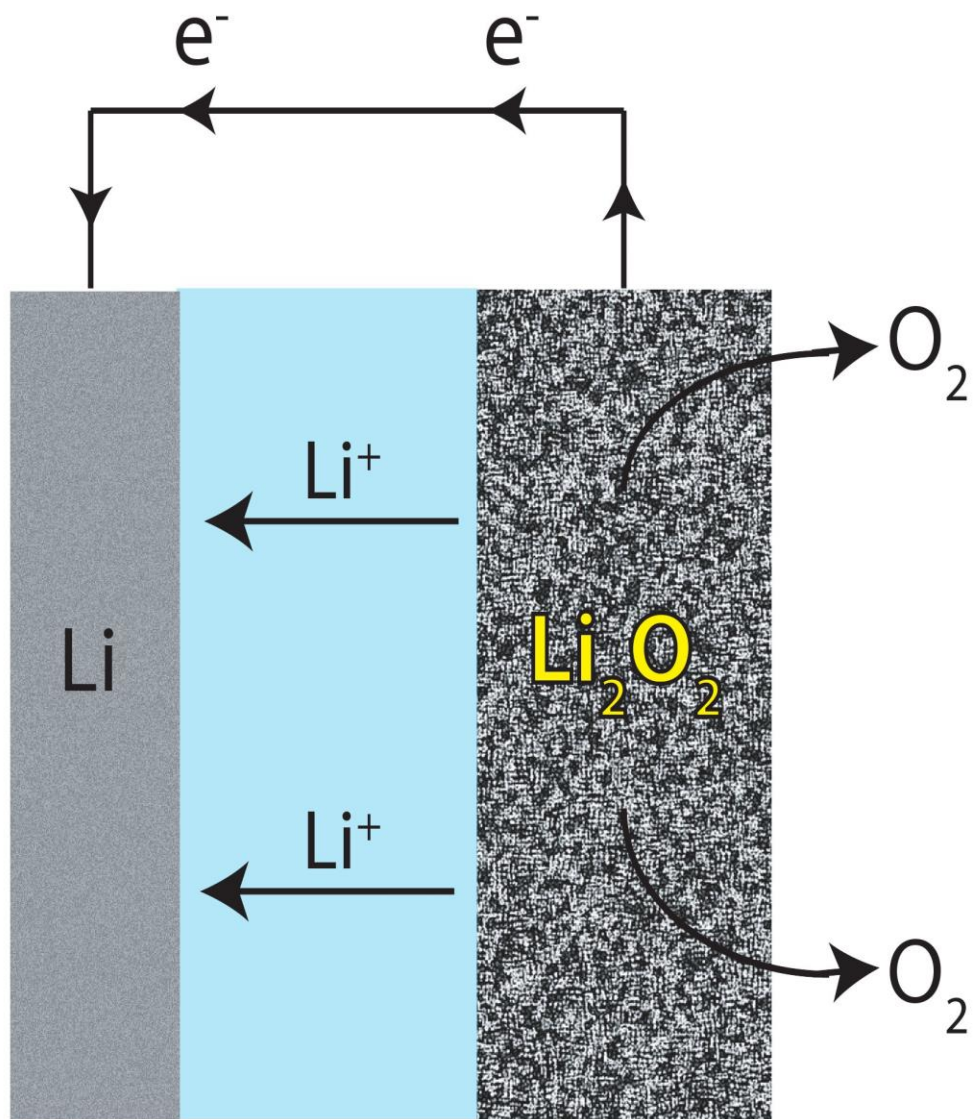
Hybrid
620 km



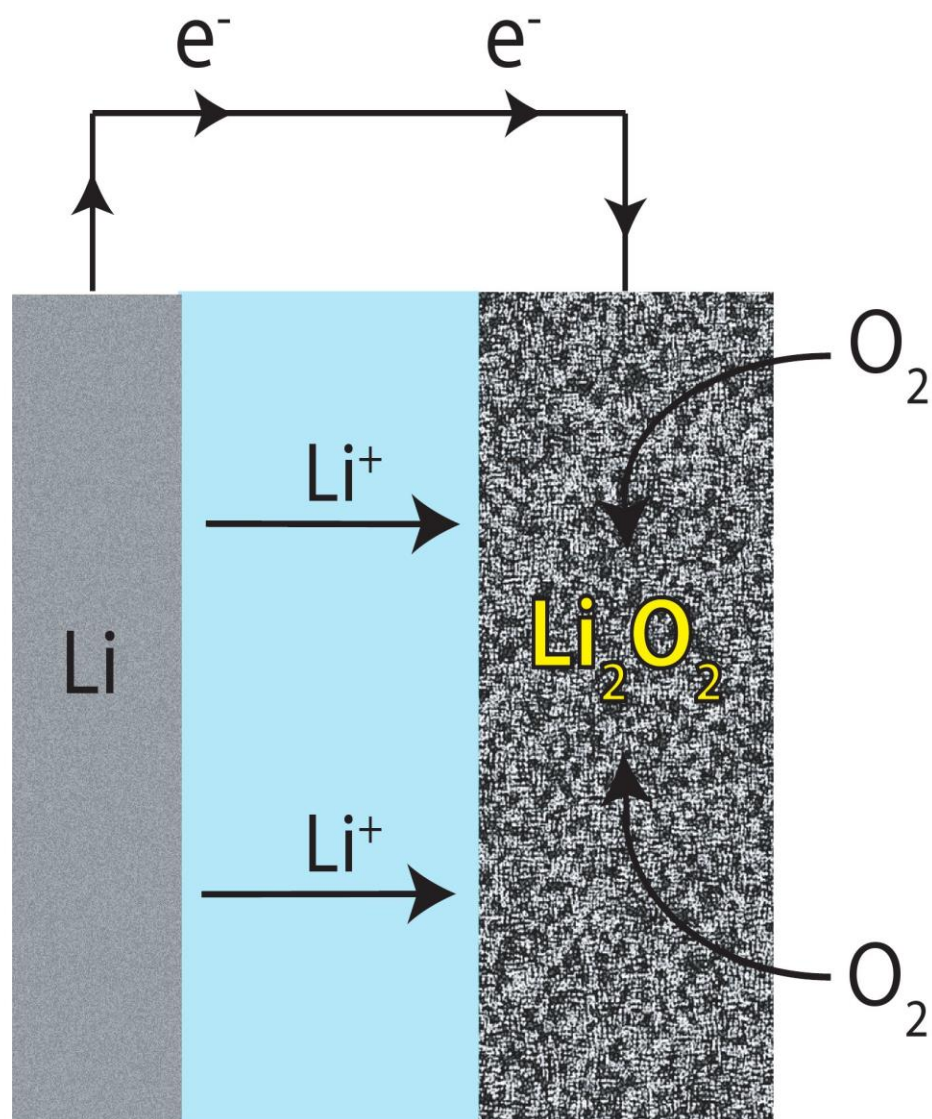




Charge



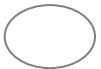
Discharge



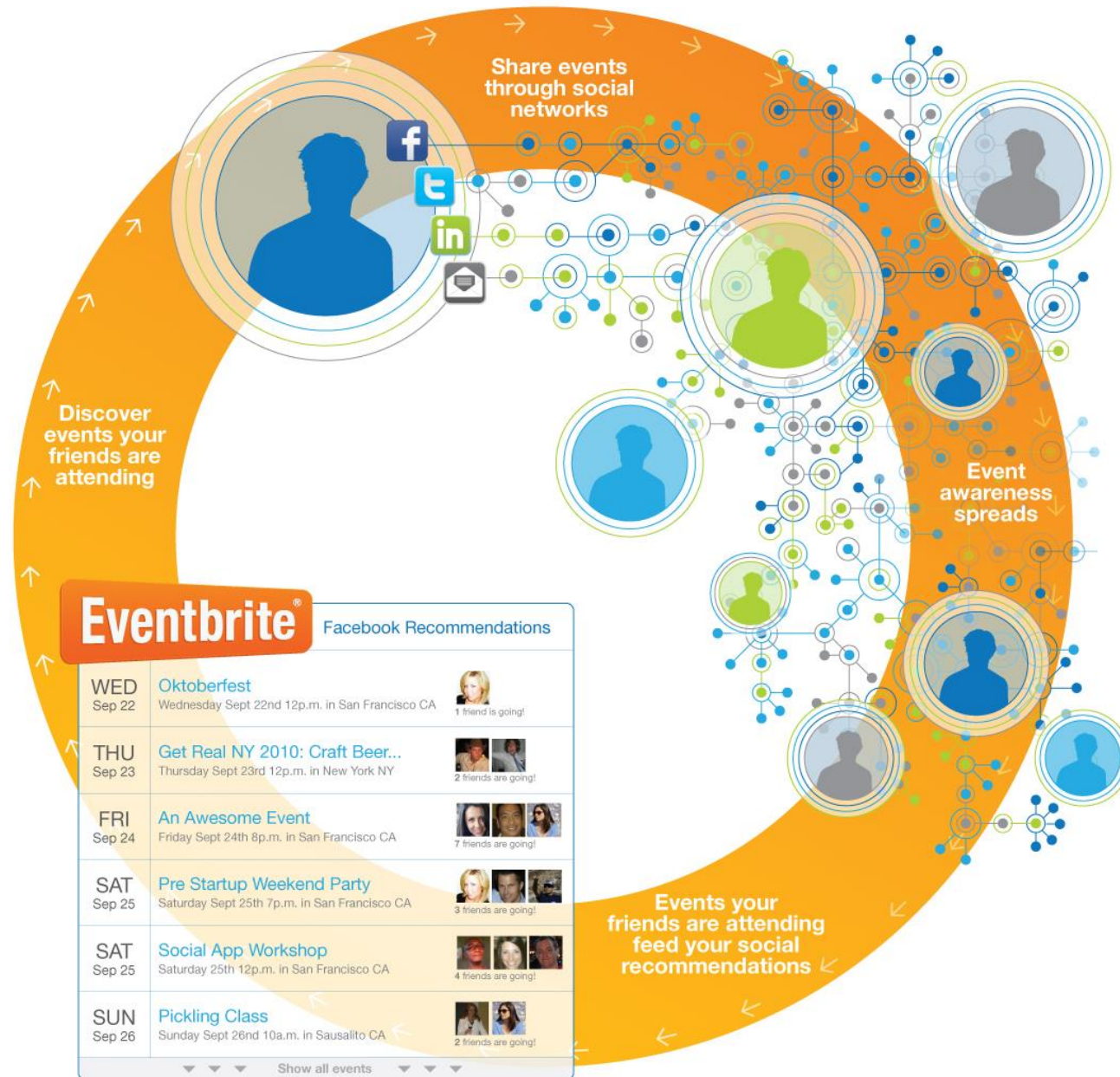


6

Social Computing



Social Event Discovery



gasoline, ev, hybrid



somsamank@gmail.c...



+ Share



Web Search interest: **gasoline, ev, hybrid**. Worldwide, 2004 - present.



Interest over time ?

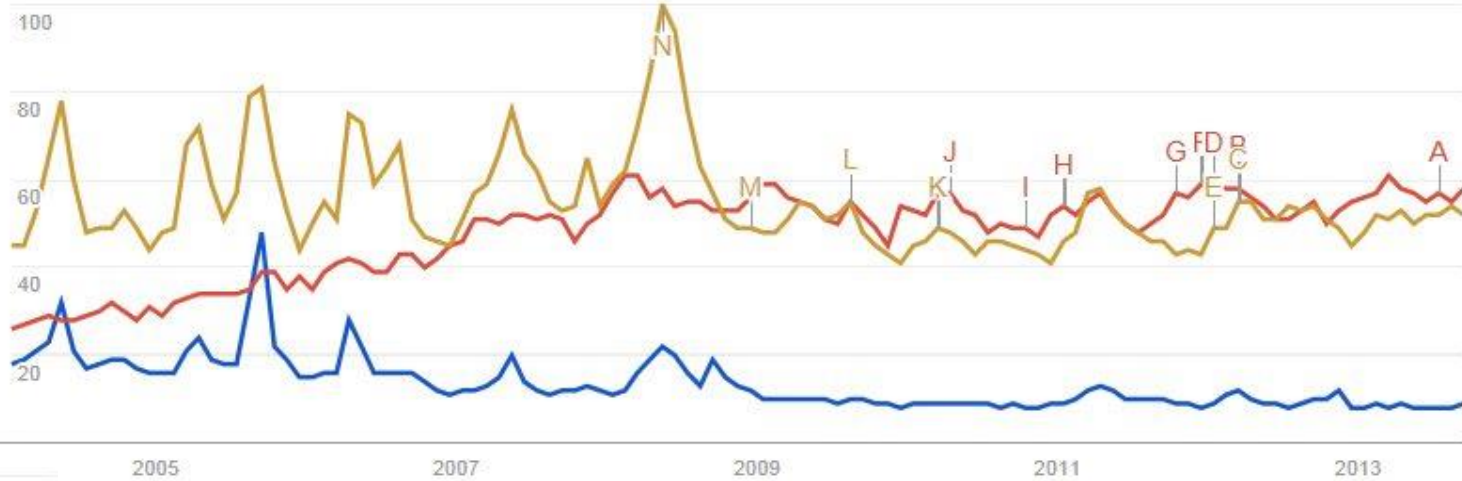
The number 100 represents the peak search interest



News headlines



Forecast ?



Search terms ?

x gasoline

x ev

x hybrid

+ Add term

Google Trends

Collect

- Social Media
- Blogs
- Twitter
- News
- Product Reviews

Analyze

Enrich and prepare social media content with metadata

Index

Enable keyword search with linguistic analysis. Search for names with fuzzy matching.

Deliver

Provide marketing professionals with instant access to social media data and analysis



Language Identification



Document Clustering



Entity Extraction

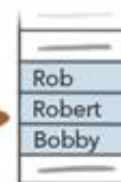


Sentiment Analysis

Keyword Search



Name Search



Reporting & analysis



Brand, product & entity monitoring



Dashboards



Advanced search & faceted navigation

Sentiment Analysis

LinkedIn's Most InDemand Employers

The world's most sought-after employers based on billions of interactions from LinkedIn's 175M+ members

 By Geography  By Function

The most InDemand employers among members **globally**



Click a company to learn more:

1 Google

2 Apple

3 Microsoft

4 facebook

5 
Unilever

6 

7 PEPSICO

8 P&G

9 McKinsey & Company

10 The Coca-Cola Company

11 The Walt Disney Company

12 

13 salesforce.com

14 

15 

16  Nestle

17 BCG
THE BOSTON CONSULTING GROUP

18 

19  Expedia

20 accenture

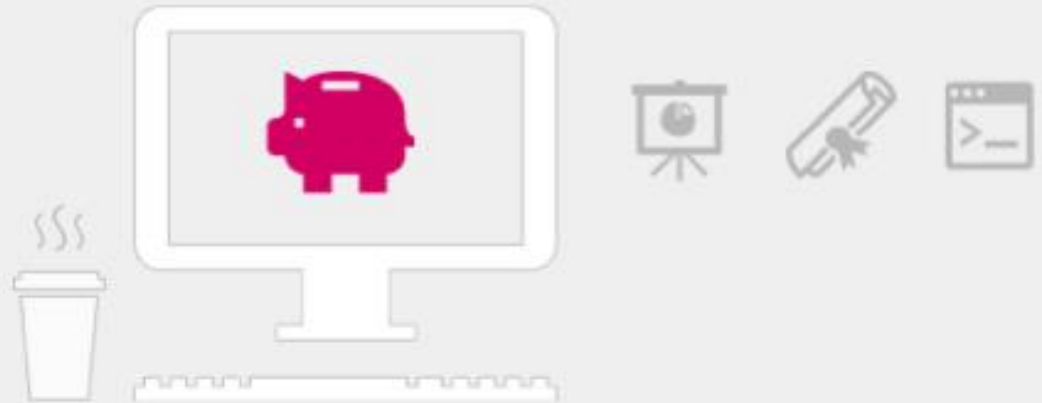
LinkedIn's Most InDemand Employers

The world's most sought-after employers based on billions of interactions from LinkedIn's 175M+ members

 By Geography

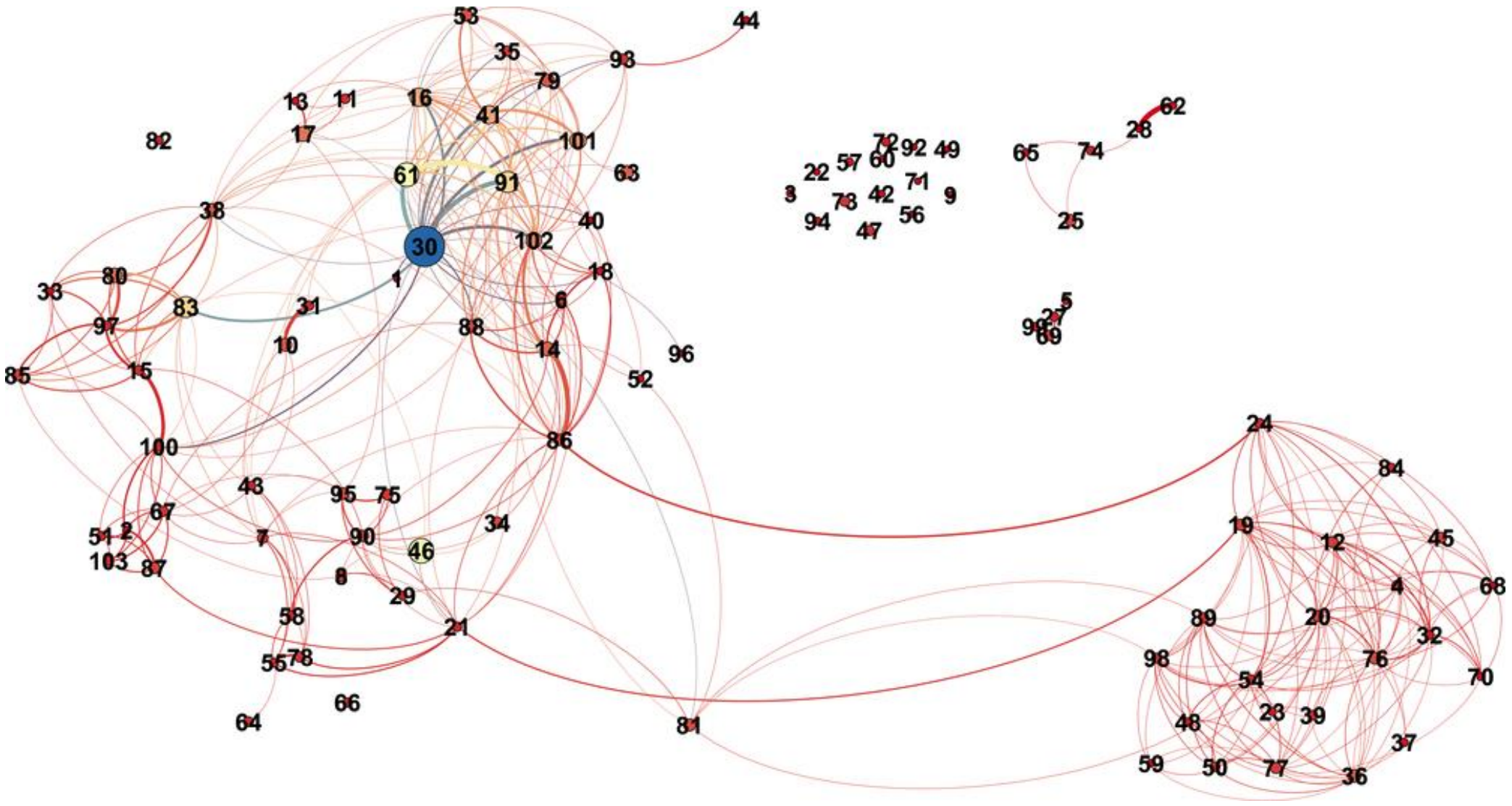
 By Function

The most InDemand employers among **Finance & Accounting**



Click a company to learn more:

- | | | | |
|-------------------------|--------------------------|-----------------------------------|------------------------------|
| 1 Deloitte | 6 KPMG | 11 Standard Chartered Bank | 16 Microsoft |
| 2 PwC | 7 Bank of America | 12 Unilever | 17 PepsiCo |
| 3 Ernst & Young | 8 GE | 13 HP | 18 Apple |
| 4 JPMorgan Chase | 9 HSBC | 14 Accenture | 19 Shell |
| 5 Goldman Sachs | 10 Google | 15 Procter & Gamble | 20 McKinsey & Company |



Sociograph

:)

75.00%

- @kaewzizzy ขามน่ารักมาก :)
- กาลครั้งหนึ่ง...^_^ นานมาแล้ว นานมากๆ นานนาน จนจำไม่ได้ 55555555 + + บริบูรณ์ :D .
- ไปตามนั้นเลย:-):-:-) <http://t.co/N6zqko5YXZ>
- เวย์อ้อมระวังบด้วยการไม่จองเวร :))
- ขอนานักจงอีกอีก3กิโหลนะ :)
- ซ้อมแล้ว เบื่อๆ :)
- เพราะคนที่เข้ามามันไม่ใช่ จะคุยกันไปก็คงไม่มีประโยชน์ :)
- บอกตรงๆ ไม่อ้อมค้อม -_-
- @bilmqboice 5555 ป่าวตื่นเต้นน กะเวลาผิด กลั้วรถติด



POP



25.00%

:(

- เสียสติขั้นสุด ไฟท์นะเนี่ยยยย
- วันแสนเจียมเหงา#น่าเบื้อ#เสียอารมณ์@อยู่คนเดียว
- แห่อยากได้เงินจนตัวสั้น5555555#อีชีโกง
- อยากเป็นนักเขียน แต่ติดตรงเขียนสิ่งที่ตัวเองคิดไม่ได้ มันปะปนกันไปหมด วกไปวนมา แล้วก็ตัน แต่งฟิคเนื้อเรื่องก็ลอย ก็พยายามแล้วแต่ก็ทำไม่ได้
- @BELLENGORN อ้าว ไมวะ ไม่ใช่เมเจอร์หรือ? ปกติเป็นไรวะ? ลืม
- ลิ้มตตีเอ็ม15 ชม. โหดไปนะครบบบ .ร้องไห้แปบ
- อี ดอก ใคร เบียด พี่ ปาร์ค ของ กู อี เวย์ ล้ม เลย อี ลีส
- เคสที่ใช้ยืมมันใหญ่มาก แต่ชื่อมาแพง499 แต่เคส

Search...

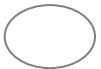
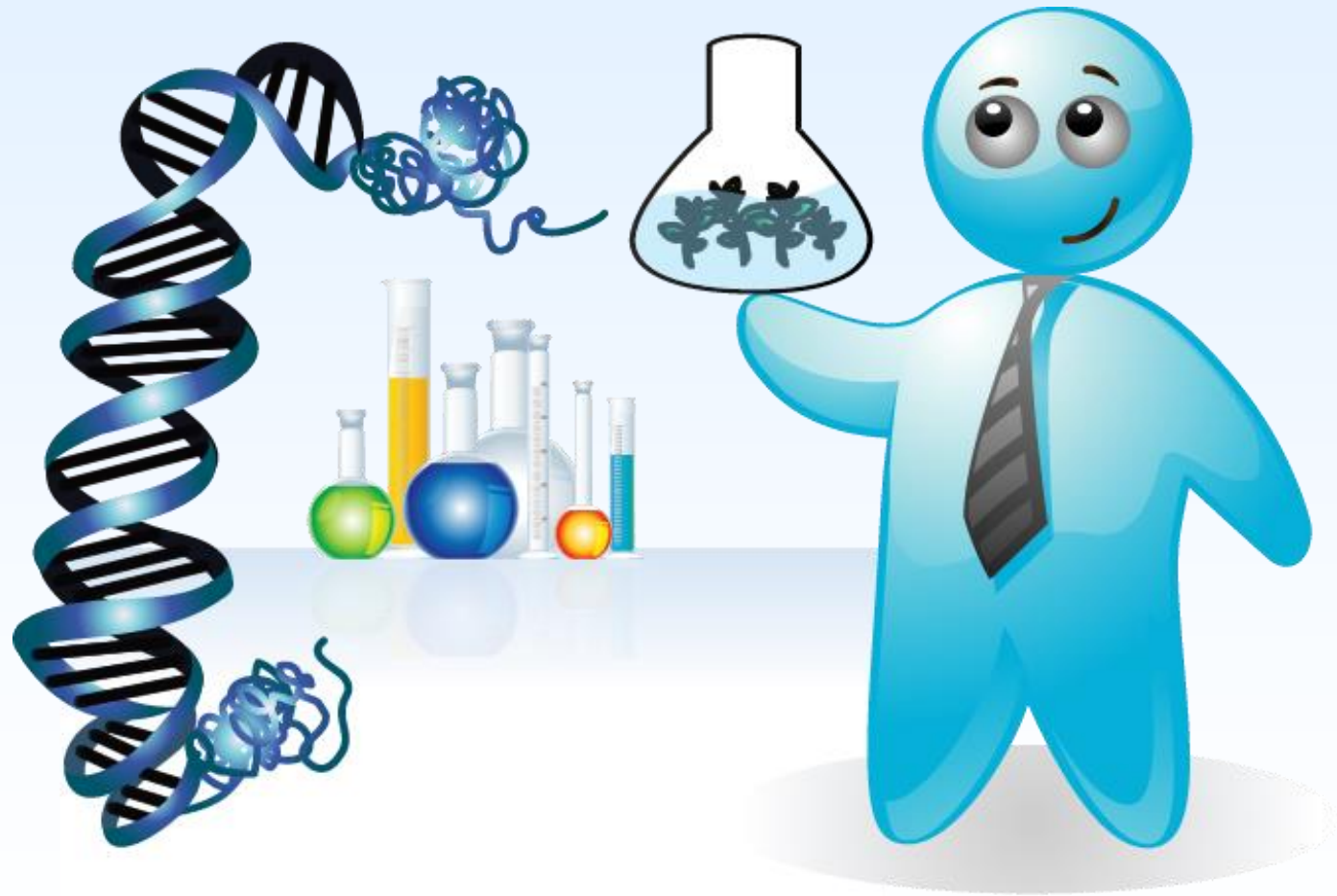


POWERED BY S-SENSE

Social Sensor – S-SENSE by NECTEC

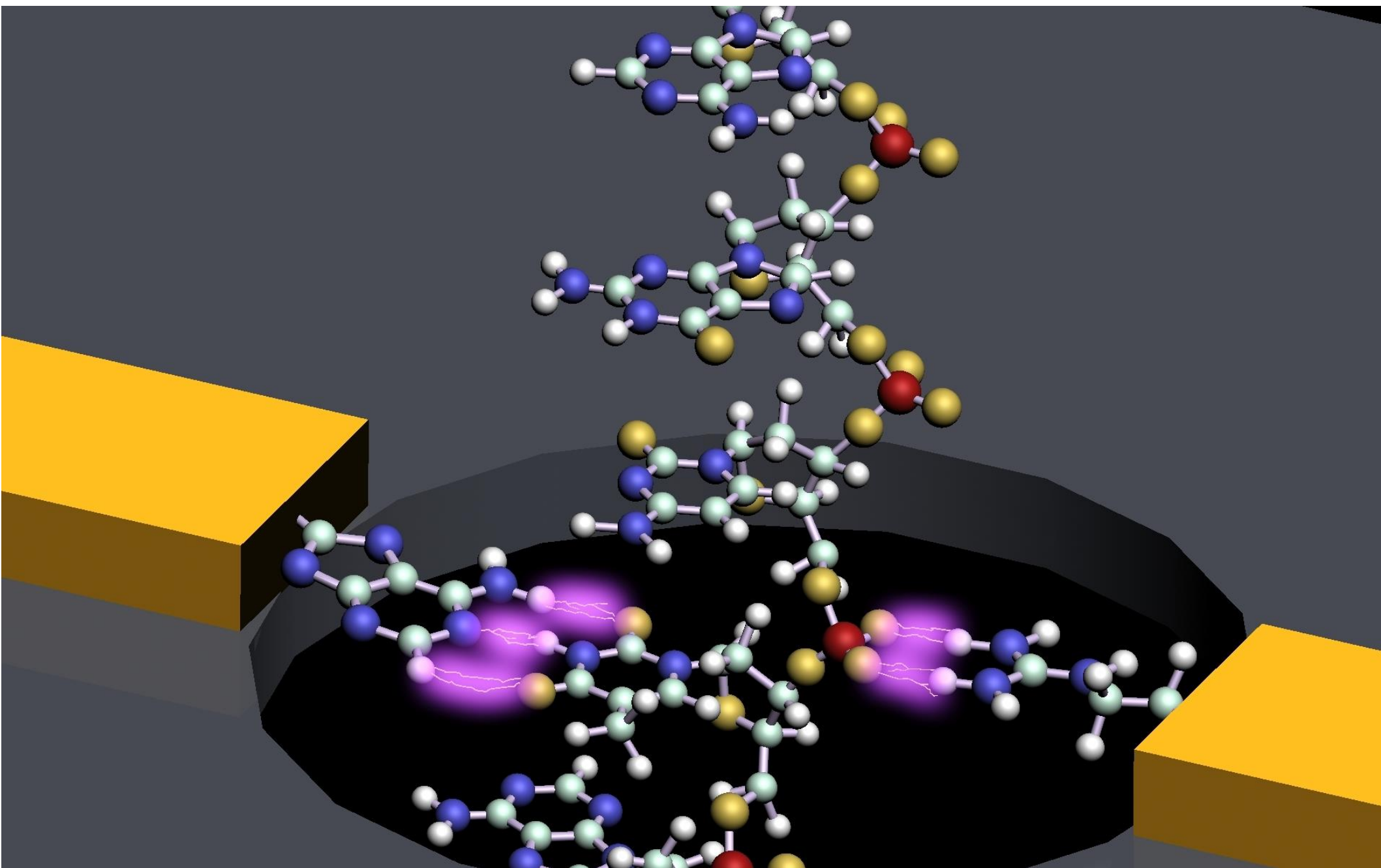
7

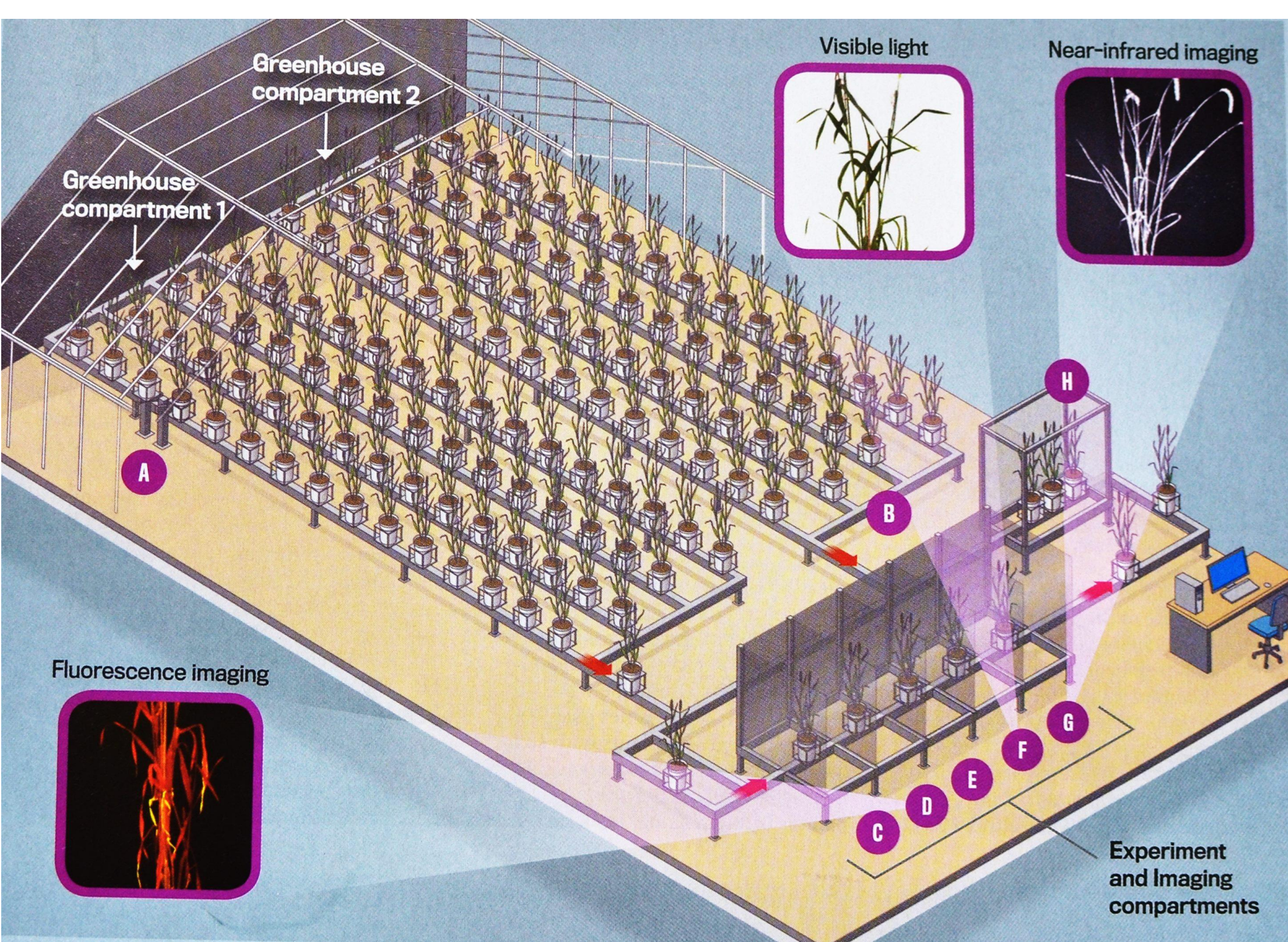
Future Crop Improvement











Greenhouse compartment 2

Greenhouse compartment 1

Visible light

Near-infrared imaging

A

B

H

Fluorescence imaging

C

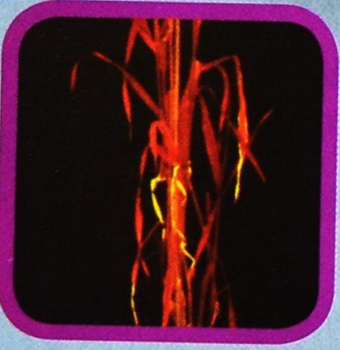
D

E

F

G

Experiment and Imaging compartments



Non-Stress



Water Stress

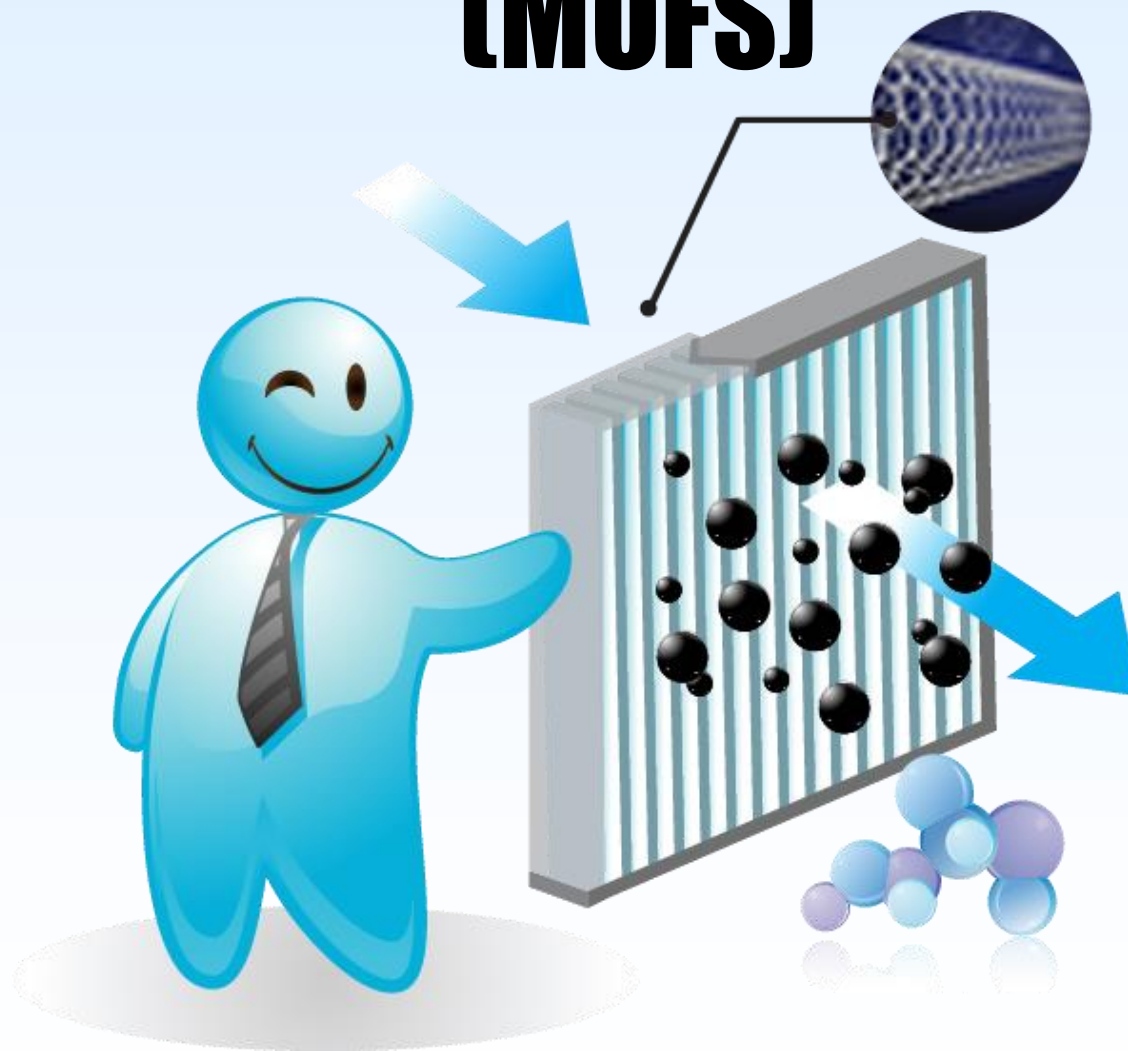


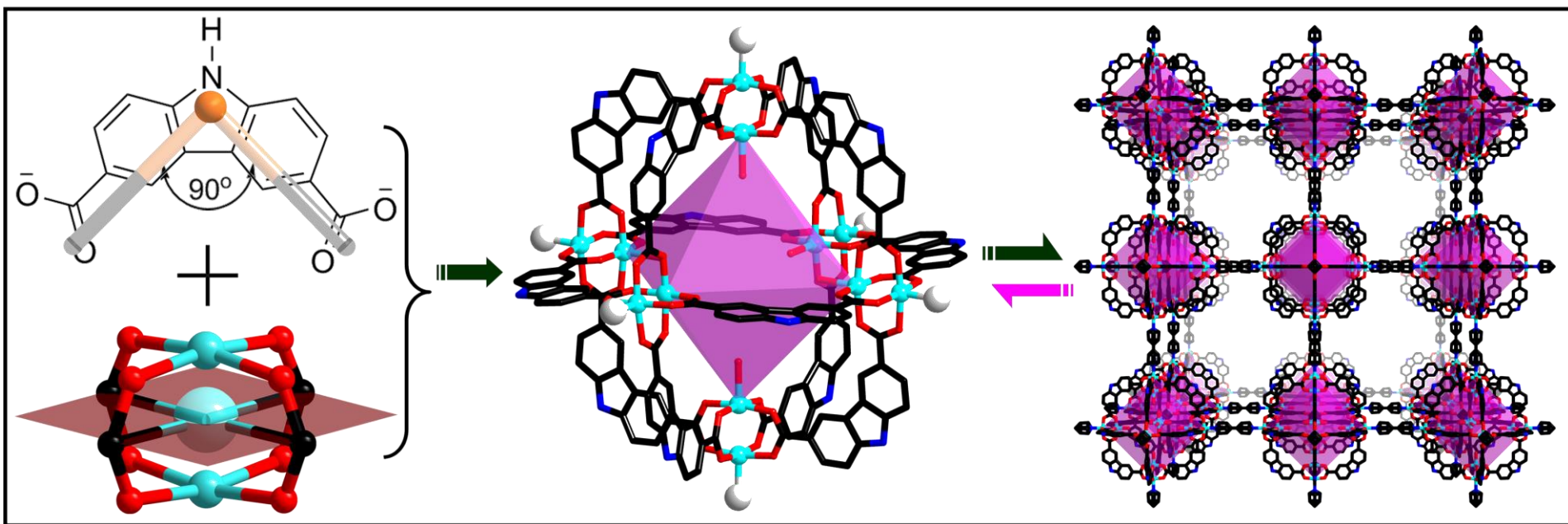
Nitrogen Stress

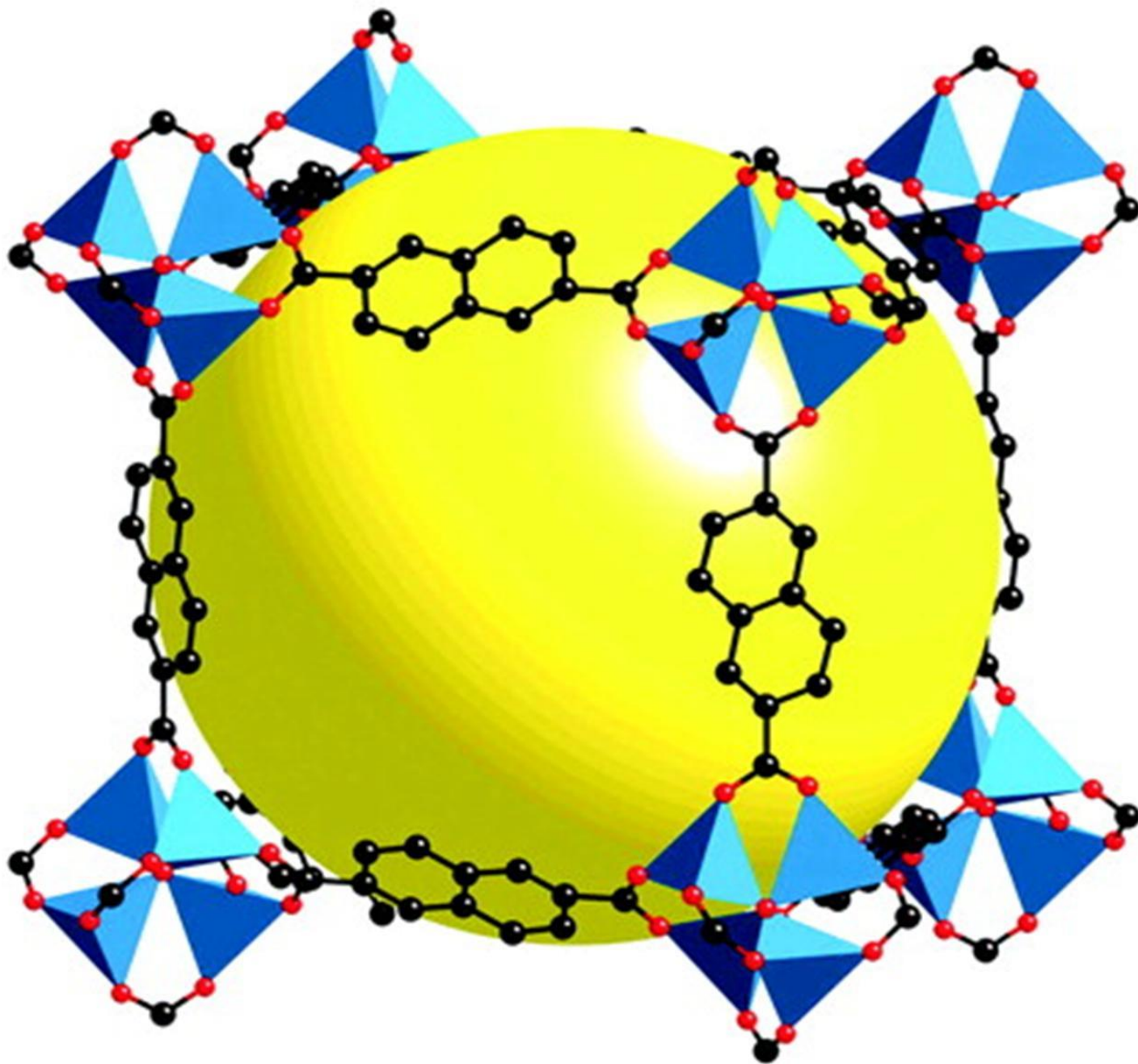


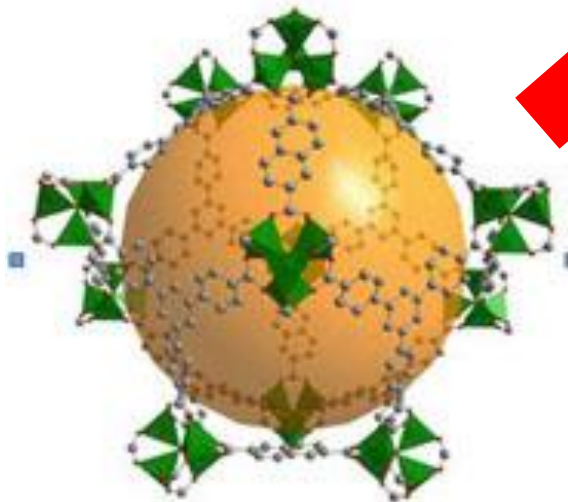
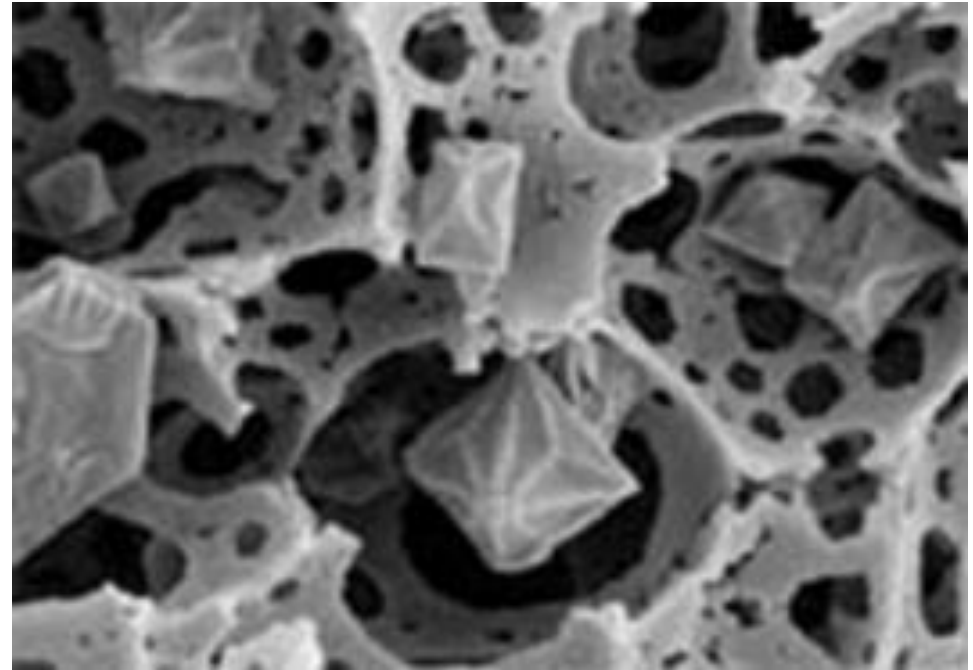
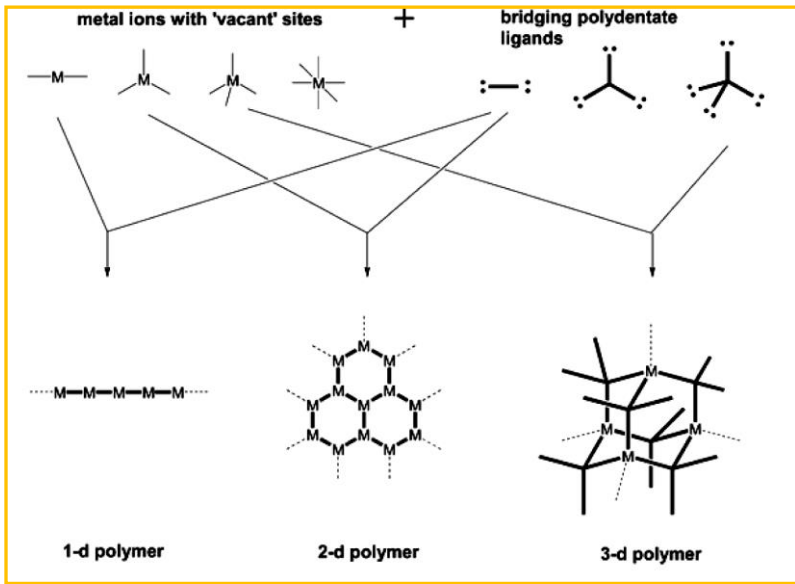
8

Metal Organic Frameworks (MOFS)

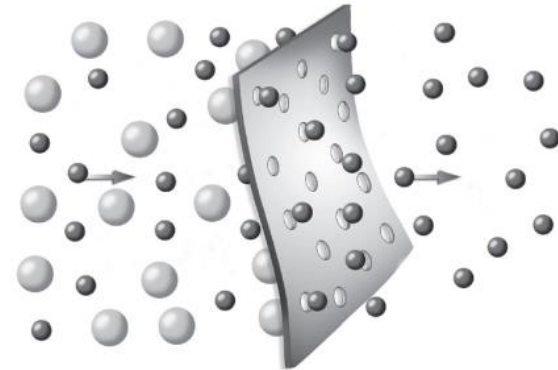






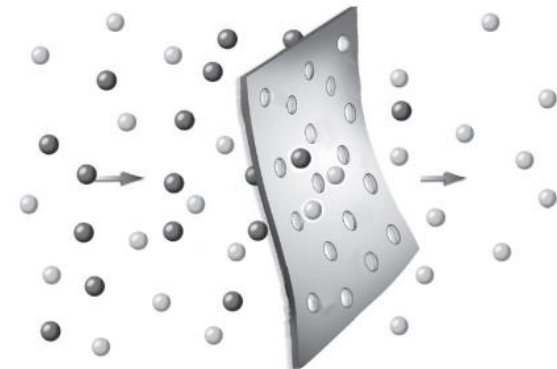


Design & Synthesis



Separation & Filtration

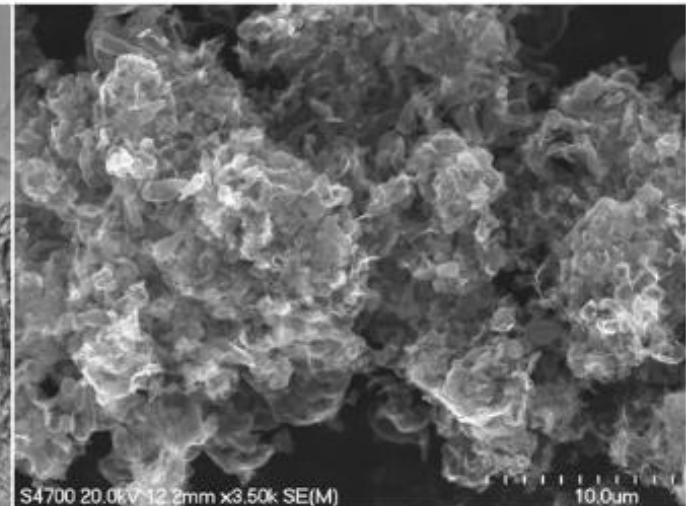
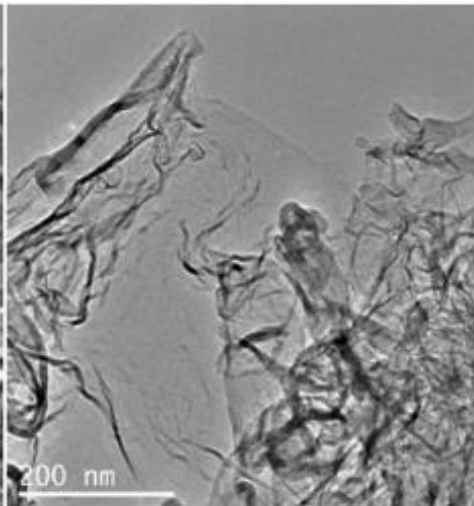
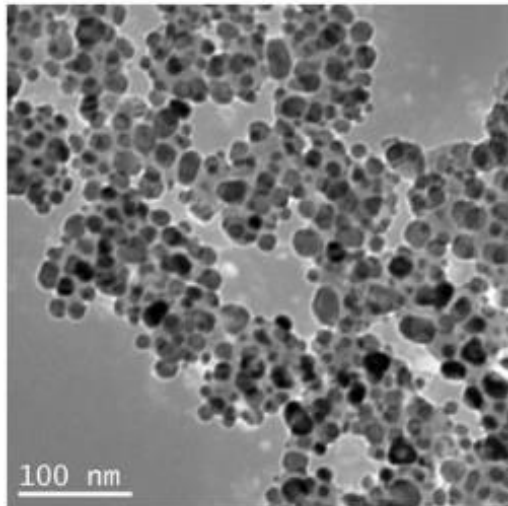
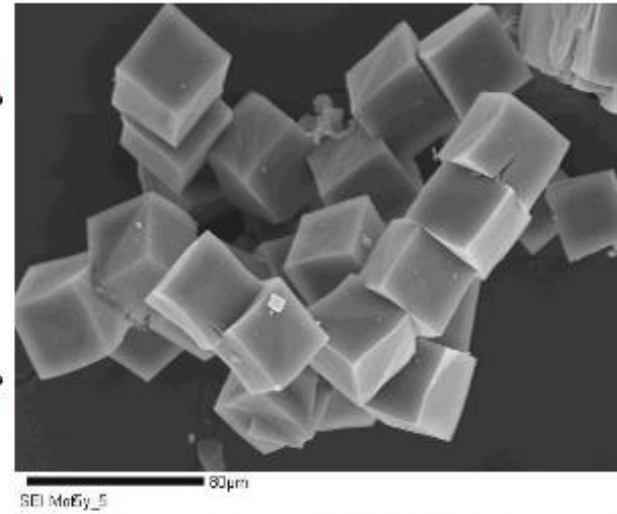
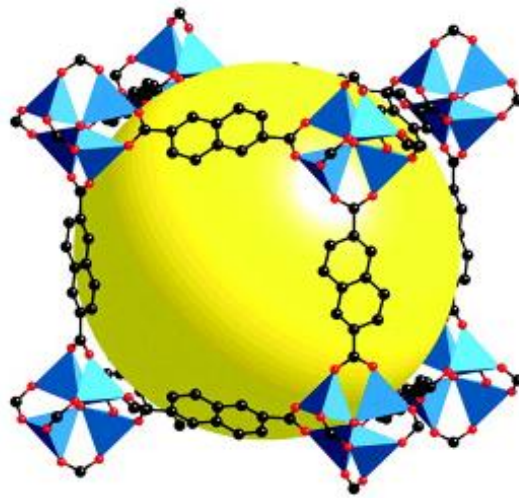
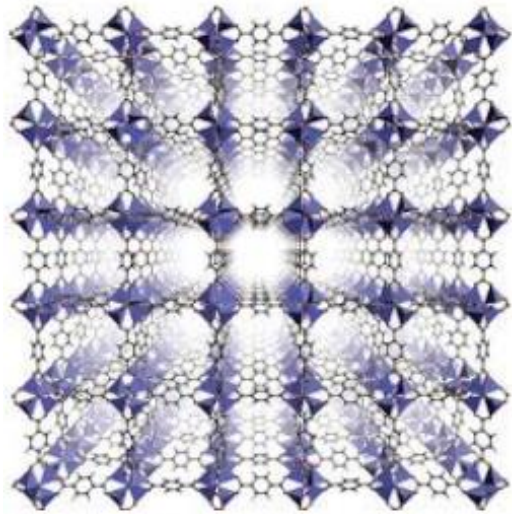
Functionalization



Molecular sieving

Metal Organic Frameworks (MOFs)

Current application



9

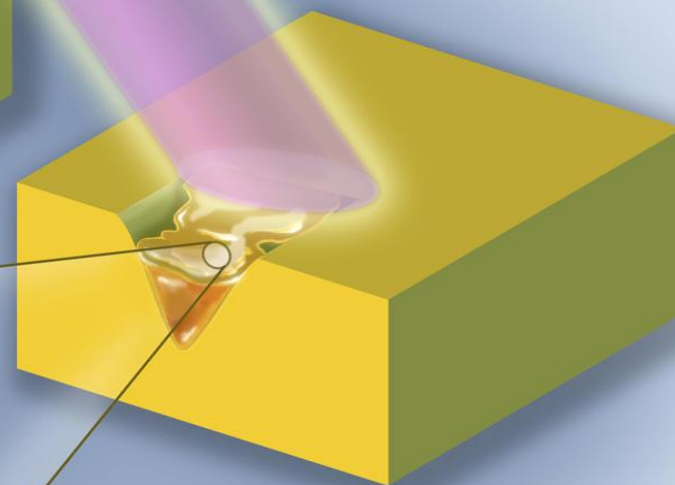
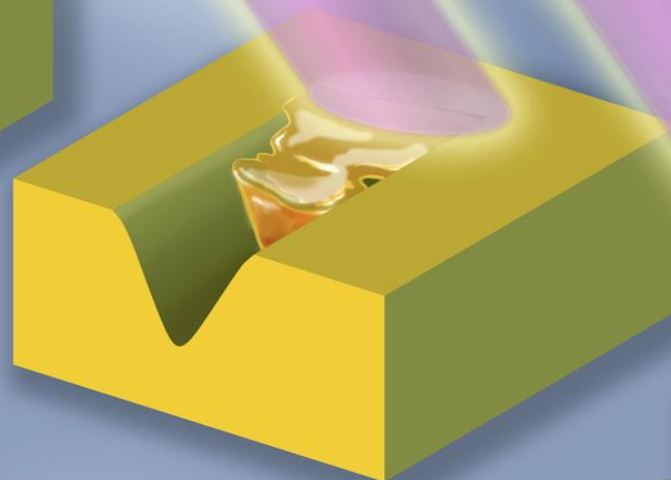
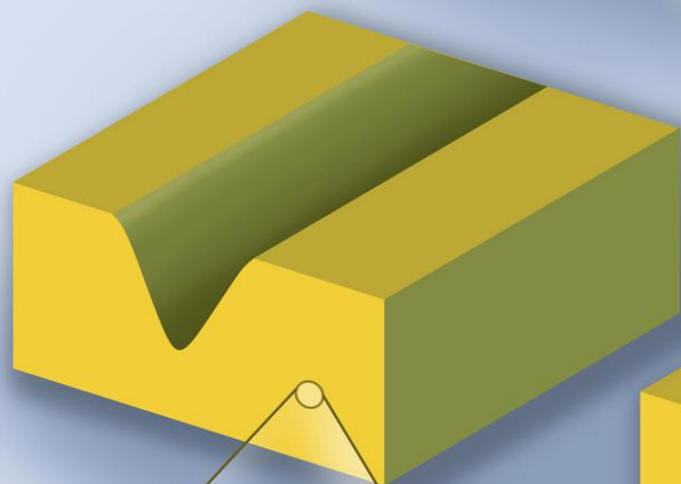
Self-Healing Materials





<http://www.youtube.com/watch?v=JMUotV2WdiU>

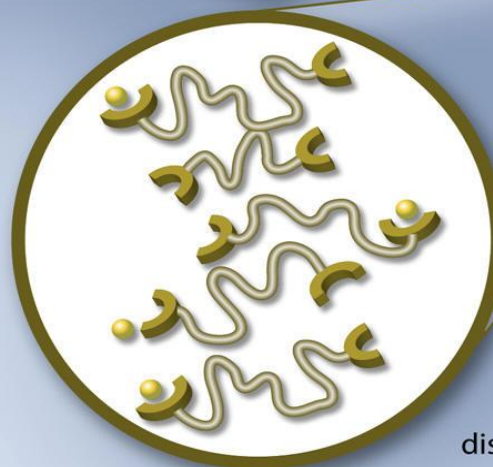
Optically-healing polymers



UV light

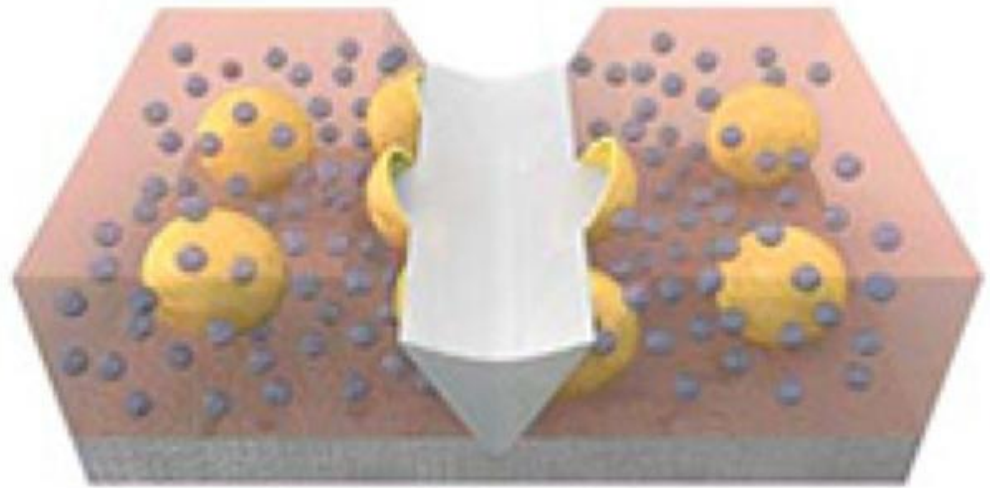
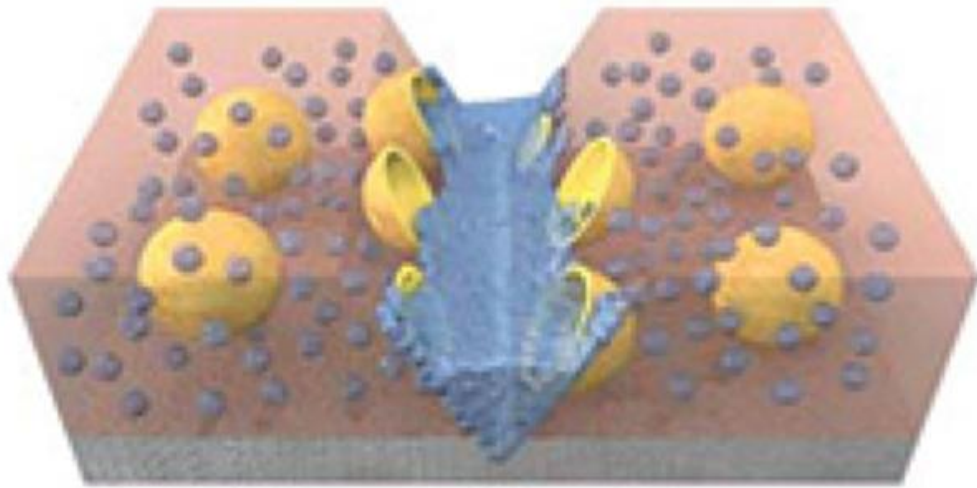
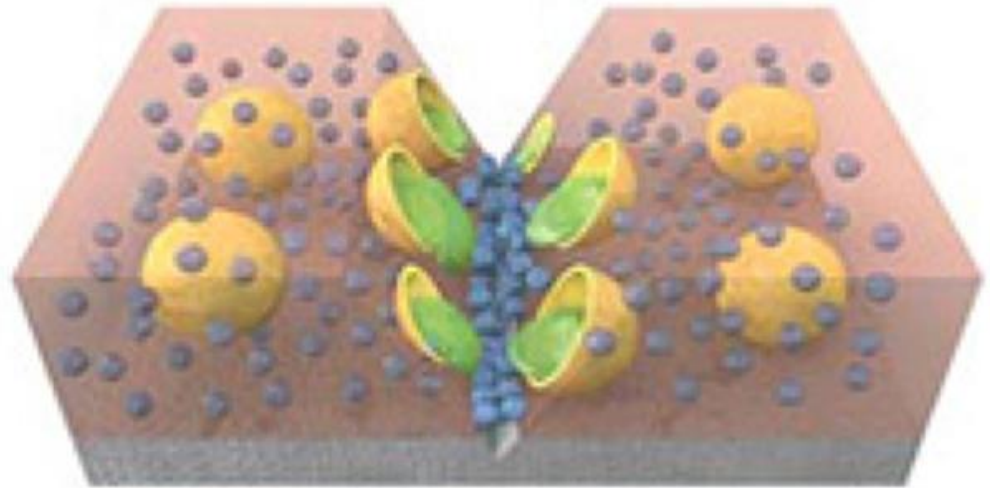
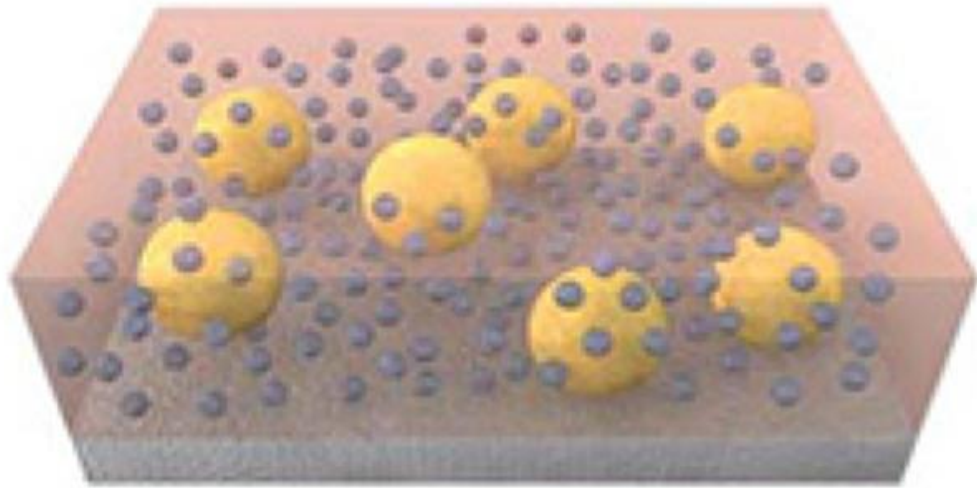


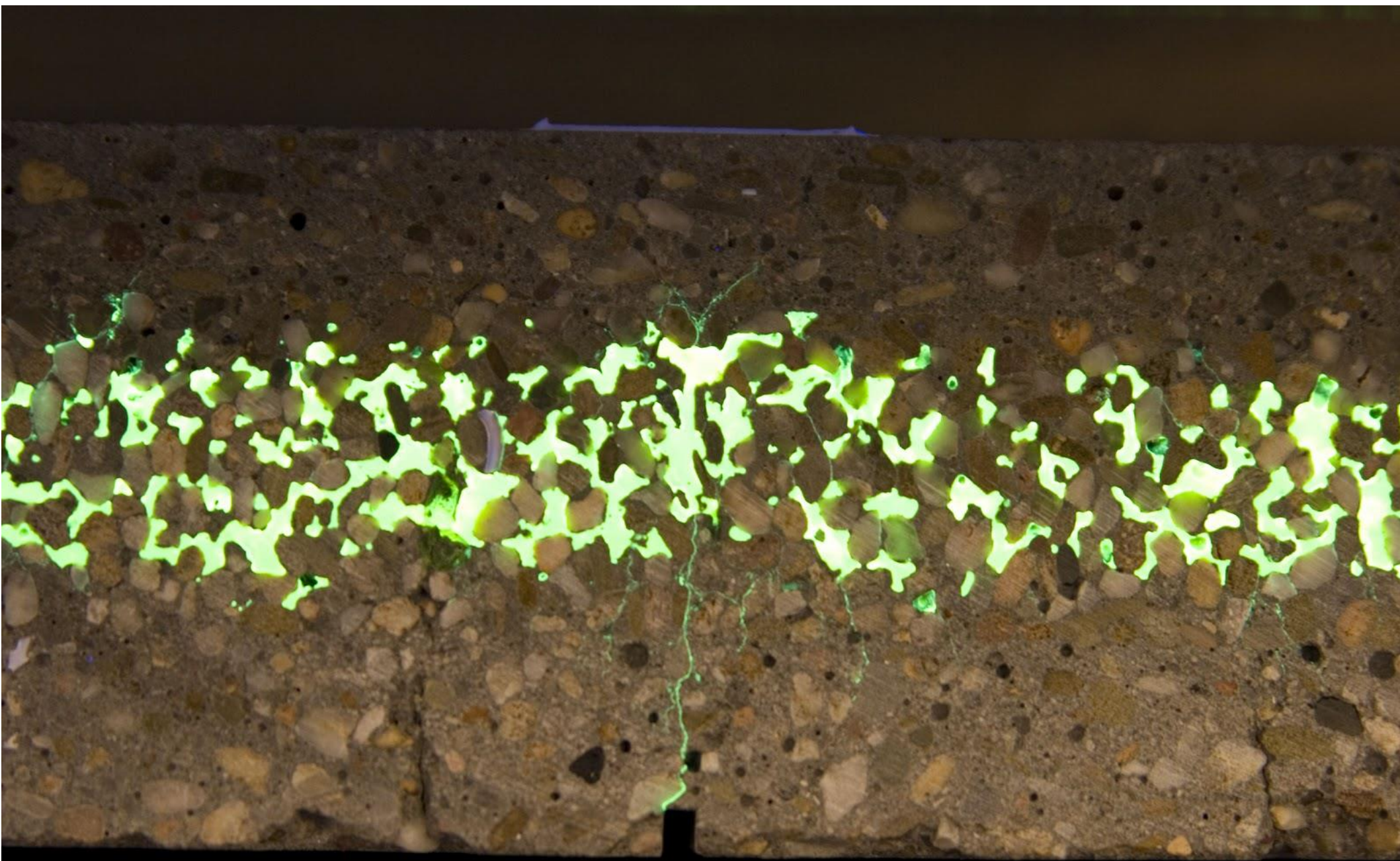
Solid state:
short string-like molecules
assembled into longer chains



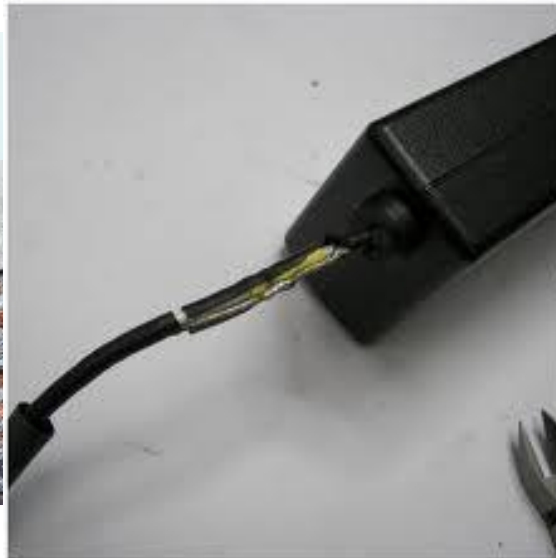
Liquid state:
UV light temporarily
disassembles structures





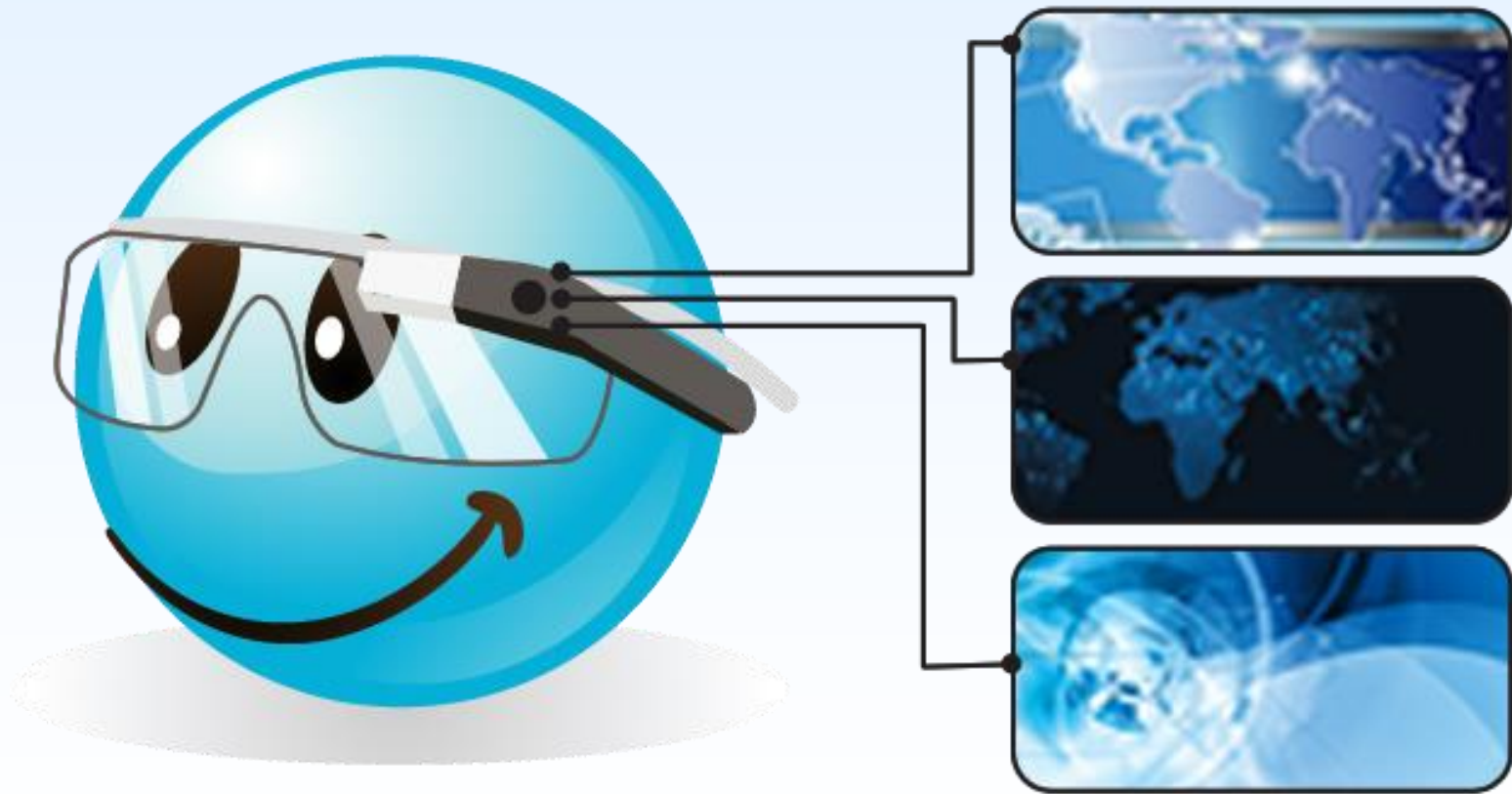


Self-healing changes the world



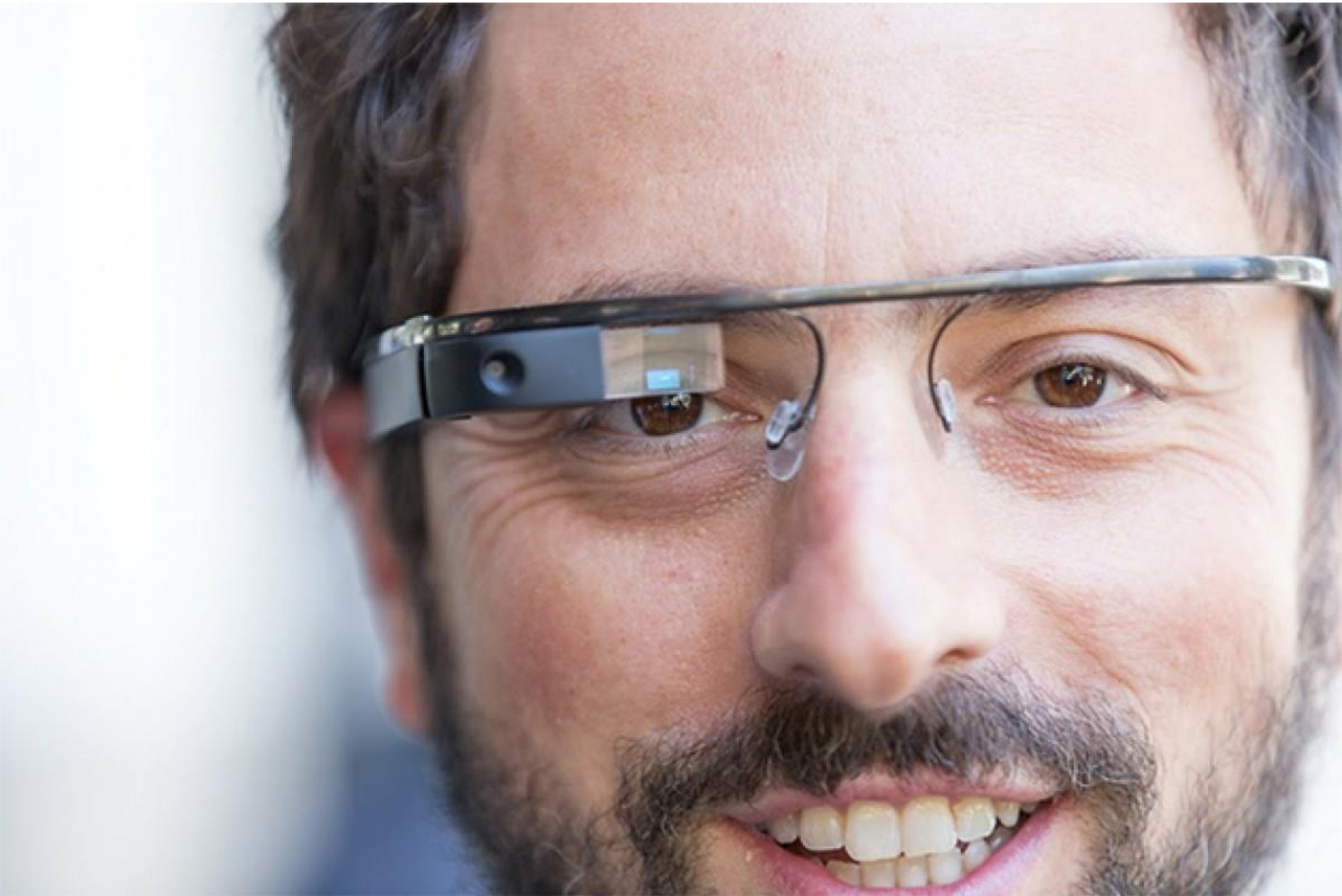
10

Augmented Reality













สิบเทคโนโลยีที่น่าจับตามอง ๒๕๕๖

- Mobile Diagnostics Tools
- Nanotheranostics
- 3D Bioprinting
- V2X
- Battery for EV
- Social computing
- Future Crop Improvement
- Metal Organic Frameworks
- Self-healing Materials
- Augmented Reality

รายนามคณะกรรมการรวบรวมข้อมูลเทคโนโลยีเพื่อนำเสนอในหัวข้อ “10 Technologies to Watch”

นายทวีศักดิ์	กอนันต์กุล	นายอดิสร	เดือนทรานนท์
		นางวรรณิพา	ทองสีมา
		นางอุทัยวรรณ	กรุดลอยมา
นายชาตรี	ศรีไพพรรณ	นางสาววทันยา	สุทธิเลิศ
		นางสาวสุหทัยา	จิระนันท์พร
		นางนตพร	จันทร์วราสุทธิ
นายสุธี	ผู้เจริญชนะชัย	นางสาวชาลินี	คงสวัสดิ์
		นางสิริรัตน์	ปิยะกุลดำรง

Image References

1: Mobile Diagnostic Tools

Mobile Blood Pressure:

http://b2b.cbsimg.net/blogs/withings_bpm_visuel3_web_1.jpg

Traditional Blood Pressure:

<http://news.menshealth.com/wp-content/uploads/2012/01/921895961-e1328019927551.jpg>

Blood Glucose Sensor:

http://farm8.staticflickr.com/7050/7126571105_9fdd727a6a_o.jpg

http://img1.mlstatic.com/glucometro-ibgstar-funciona-con-tu-ipod-iphone-ipad-touch_MCO-O-4221085012_042013.jpg

Cancer Camera:

<http://biomedicaloptics.spiedigitallibrary.org/article.aspx?articleid=1183031>

Image References

2. Nanotheranostic

Antibody Binding:

<http://bencowsill.com/images/binding.png>

Nanotheranostic : <http://www.nature.com/nmat/journal/v10/n4/full/nmat2986.html>

Plasmonic Nanobubble:

<http://nanotechweb.org/cws/article/lab/41741>

Nanotheranostic Video Clip:

<http://www.youtube.com/watch?v=AUQDyCeQvgk>

Image References

3. 3D Bioprinting

3d Printer:

<http://realitypod.com/wp-content/uploads/2013/03/77-600x640.jpg>

กระโหลก 3D:

http://nerd-alert.net/wp-content/uploads/2011/03/printed_skull.jpg

Organ Printing:

<http://www.swide.com/art-culture/science/health-science-moves-towards-organs-to-order-kidney-transplant/2013/4/25>

How bioprinting works:

<http://www.adafruit.com/blog/2013/01/24/modern-meadow-aims-to-print-raw-meat-using-bioprinter-3dthursday/>

2-arm bioprinter:

<http://www.loe.org/content/2013-04-12/MABP.jpg>

Image References

4. V2X

Volkswagen V2X:

http://www.cargroup.org/assets/speakers/presentations/39/weith_frank.pdf

V2X Video Clip:

<http://www.youtube.com/watch?v=vU4eI3xsZA4>

Image References

5. Battery for EV

Battery Graph:

<http://www.green-and-energy.com/wp-content/uploads/2011/03/BatteryGraph.jpg>

Tesla Charging Station:

http://www.ebaymotorsblog.com/wp-content/uploads/2013/02/spacex_sm.jpg

Li/Air Mechanism:

<http://upload.wikimedia.org/wikipedia/commons/e/e4/Li-air-charge-discharge.jpg>

BMW i3:

http://s3.motoringfile.com/wp-content/uploads/2013/07/P90127388_highRes1.jpg

Image References

6. Social Computing

Social Event Discovery:

<http://blog.eventbrite.com/social-event-discover/>

Google Trends:

<http://www.google.com/trends>

Sentimen Analysis:

<http://www.basistech.com/graphics/social-media-monitoring-app-large.png>

LinkedIn:

<http://www.obvoc.com/wp-content/uploads/2012/10/wpid-Photo-Oct-23-2012-1943.jpg>

Sociograph:

<http://2.bp.blogspot.com/-FuMWBmie14I/Taa9VYpSLnI/AAAAAAAAAHA4/10cyqvpcC8g/s400/mit-horizontal.png>

S-Sense:

<http://www.it24hrs.com/wp-content/uploads/2013/04/s-sense-01.png>

Image References

7. Future Crop Improvement

The Scanalyzer:

<http://www.lemnatec.com/sites/default/files/shareimages/scanalyzer-hts/scanalyzer-hts.jpg>

Plant Accelerator:

http://www.lemnatec.com/sites/default/files/shareimages/scanalyzer3d/gallery1/LEMNA_TEC_PH-086102-32bc1.jpg

Nanopore Sequencing:

http://www.biodesign.asu.edu/images/image/103/nanopore_sequencing_illustration.png

The Phenomics Center:

Sarchet, P., The Green Machine, Focus, Issue 258, August 2013

Image References

8. Metal Organic Framework (MOF)

Framework:

<http://www.chem.tamu.edu/rgroup/zhou/images/Technical%20Illustrations/Research%20VIII.png>

Hydrogen Capture:

<http://www.mse.mtu.edu/~yunhangh/Pictures/Research%20Pictures/MOF8.JPG>

NanoMOF:

<http://www.nanomof-project.eu/>

Image References

9. Self-Healing Material

Terminator Clip:

<http://www.youtube.com/watch?v=JMUotV2WdiU>

Self-Healing Mechanism:

http://www.outlookseries.com/A0997/Science/3922_S3.jpg

Self-Healing Paint:

http://www.fastcompany.com/multisite_files/fastcompany/imagecache/1280/fc_files/2009/1209265-self-healing-paints-clot-like-blood-rotator.jpg

Self-Repairing Concrete

<http://4.bp.blogspot.com/->

[0lAtbtw5rXs/TtJP8bufp5I/AAAAAAAAAQg/6cQXtfjAFi4/s320/06+2nd+Cycle+%252B+2nd+Crack+%2528Notch%2529.jpg](http://4.bp.blogspot.com/-0lAtbtw5rXs/TtJP8bufp5I/AAAAAAAAAQg/6cQXtfjAFi4/s320/06+2nd+Cycle+%252B+2nd+Crack+%2528Notch%2529.jpg)

Image References

10. Augmented Reality

wikitude:

<http://www.travelersdaily.com/wp-content/uploads/2013/06/Wikitude.jpg>

AR Object:

http://i2.wp.com/www.inglespanishonline.com/wp-content/uploads/2013/02/Lukeville_2.jpg

Google Glass:

<http://www.elchoromatutino.com/wp-content/uploads/2013/06/Google-glass.jpg>

IKEA:

http://i1.ytimg.com/vi/AyDT_pUa4h8/maxresdefault.jpg

Audi:

http://c.fastcompany.net/multisite_files/codesign/poster/2013/08/1673268-poster-1280-audi.jpg