

Descartes Prize 2003 Documentary (English version)

Introduction

10:00 02 00

Commentary :

René Descartes was a mathematician, natural scientist, and philosopher, a European citizen, and a great historic figure of learning.

10 00 12 00

The prize that bears his name acknowledges that science today is not the preserve of a single brilliant mind in a single country.

10:00 21 00

Commentary :

Here are the eight projects of the European research partnerships that have been short-listed for the 2003 Descartes Prize.

Sujet MOLS-IN-MOTION :

10 :00 :35:00

David Leigh :

A racehorse because it's beautiful, fast, dynamic, and exciting. But then sometimes it falls at the first hurdle, breaks its leg, and you have to shoot it.

David Leigh :

I've chosen a philosopher's tool, Ockham's Razor, because the simplest way is often the best.

David Leigh :

A newborn baby because you know where it's come from, but you've no idea what it's going to grow up to be.

10:01:13:09

THE TEAMS :

David Leigh :

I'm Dave Leigh, and I'm the coordinator of the project "Molecules in Motion."

David Leigh :

We were just trying to make a chemical sensor for carbon dioxide by binding it in a large macrocyclic ring. But when we tried to make the macrocyclic ring, what we actually got were interlocked rings, like the links on a chain. And that's how the story started.

10:01 33 00

Map off voice:

This research has gathered teams from the University of Edinburgh, the Italian National Research Council in Rome, the University of Bologna, the CEA in Paris, the University of Amsterdam, and the University of Groningen.

10 :02 :03 :19

THE RESEARCH :

David Leigh :

If we could control the way that molecules move, and make them stretch in the way that we want, and rotate, and translate and move, then we will be able to make materials that are smarter, more intelligent, and can respond and are programmable. That's the vision of the "Molecules in Motion" project.

David Leigh :

We design and prepare molecules which can act as the components for molecular machines. It's really just like molecular Lego. Here's the example of a structure that can act like a piston.

The blue ring can sit on the yellow part of the molecule and then be moved by some stimulus, perhaps light, onto the white just like the ring moving up and down a shaft in a piston.

David Leigh :

Nature uses molecular motion to do things, controlling molecular motion. If you could control how this move, if you could control translation motion. If you could control how this move, you could control rotation motion. If you could control translation motion and rotation motion, that's everything.

10:03:09:16

THE METHOD :

David Leigh :

What our team does is really engineering but on a very tiny scale. What we do is that we design and construct and characterize machines with molecular components that are just a millionth of a millimeter across.

David Leigh :

In order to go from the synthesis of simple molecules, we need this wide body of experts across chemistry and physics in order to characterize the molecules at each stage, evaluate their properties, learn how to switch and assemble them in order to formulate the final products..

10:03:41:07

THE RESULTS :

David Leigh :

If we could control the dynamic properties of molecules, as well as just their static properties, then we think we'll be able to have a revolutionary effect on all kinds of materials research. Imagine, for example, being able to have paints that can change their colour on the flick of a switch, or that could, are self-cleaning in response to just shining them with lights of different colours. Imagine computers made of molecular-sized switches with hundreds and thousands of times as much memory as is possible today. All these kinds of things are going to be possible by controlling the motion in molecular level machines.

Sujet ANIMALPHARM

10:04:19:00

Adriana Maggi :

If my research were an animal it would be a draft horse because it ploughs the heaviest soil.

Se la mia ricerca fosse un animale, sarebbe un cavallo da tiro, perché dissoda i terreni più duri.

Adriana Maggi :

If my research were a tool it would be a picklock, because it could open doors keys cannot unlock.

Se la mia ricerca fosse un regalo sarebbe un uovo di Pasqua, perché sembra uguale a tutte le altre dal di fuori, ma dentro dà dei risultati molto nuovi.

Adriana Maggi :

If my research were a present it would be an Easter egg, because from the outside it looks like all the others, but the inside gives surprisingly new results.

Se la mia ricerca fosse uno strumento sarebbe un grimaldello, perché potrebbe aprire le porte là dove le chiavi non hanno successo.

10:05:07:17

THE TEAMS :

Adriana Maggi :

*Hello, my name is Adriana Maggi and I'm project coordinator for the European project "Animalpharm".

Buongiorno, sono Adriana Maggi, e sono il coordinatore del progetto europeo "AnimalPharm".

Adriana Maggi :

We started studying the way oestrogens work twenty years ago when oestrogens were still believed to regulate only the reproductive organs.

Abbiamo iniziato a studiare l'azione degli estrogeni 20 anni fa, quando ancora si pensava che gli estrogeni agissero solo negli organi riproduttivi.

Adriana Maggi :

Now we know that oestrogens regulate different processes and that is the object of our research.

Oggi noi sappiamo che gli estrogeni lavorano al di fuori degli organi riproduttivi, e questo è l'oggetto della nostra ricerca.

10: 05 32 00

Map off voice:

This research has gathered teams from the University of Milan, the Imperial College of Science Technology and Medicine in London, and the Leiden University Medical Center.

10:05:50:03

THE RESEARCH :

Adriana Maggi :

Administering oestrogens to post-menopausal women prevents osteoporosis, cardiovascular risks and may also delay the appearance of certain pathologies like Alzheimer.

la somministrazione di estrogeni nelle donne nella post-menopausa, previene l'osteoporosi, previene anche il rischio di accidenti di tipo cardiovascolare e sembra anche ritardare la manifestazione di patologie quali l'Alzheimer.

Adriana Maggi :

Administering oestrogens to post-menopausal women can, however, be a problem; with these beneficial effects it can also cause unwanted and even very serious side effects.

Tuttavia, quando noi diamo gli estrogeni alle donne in post-menopausa, abbiamo un problema: perché, accanto a questi effetti benefici, abbiamo una serie di effetti non desiderati, e anche molto gravi.

10:06:16:19

Adriana Maggi :

Thanks to our research we are discovering that the receptor of the estrogens responds to the oestrogens but to as well as other factors.

Grazie alla nostra ricerca stiamo capendo che il recettore degli estrogeni risponde non soltanto agli estrogeni ma ad altri fattori.

Adriana Maggi :

in non reproductive organs, we think that it is not the oestrogen that is active but a factor that is synthesised by the liver. Once in circulation, it activates the brain, bones and cardiovascular system

Noi pensiamo che, negli organi non riproduttivi, non sia l'estrogeno ad agire, ma sia un fattore che viene sintetizzato a livello epatico e che poi va in circolo e va ad agire, appunto, nel cervello, nelle ossa, o a livello del sistema cardiovascolare.

Adriana Maggi :

By administering to post-menopausal women the factor we have discovered we can obtain the positive effects of our therapy without any of the side effects.

somministrando alle donne in post-menopausa il fattore che noi abbiamo trovato esistere, noi avremo gli effetti benefici della nostra terapia, senza avere gli effetti indesiderati.

10:06:56:06

THE METHOD :

Adriana Maggi :

The method we used was a transgenic mouse whose trans-gene is luciferase, an enzyme that produces photons

Il metodo che abbiamo utilizzato è un topo transgenico in cui il transgene è la luciferasi, un enzima che produce fotoni.

Adriana Maggi :

Each time we activate the oestrogen receptor, photons are produced and different organs of the animal emit light.

Ogni volta che noi attiviamo il recettore degli estrogeni, vediamo produzione di fotoni, e quindi vediamo che l'animale si illumina in organi diversi.

Adriana Maggi :

This enable us to observe in vivo during the animal's different cycles when and where the oestrogen receptor is active.

In questo modo noi possiamo osservare in vivo, durante le varie fasi del ciclo dell'animale, quando e dove il recettore degli estrogeni è attivo.

10 :07 :29 :00

THE RESULTS :

Adriana Maggi :

We now give oestrogens to post-menopausal women as a hormone replacement therapy.

Oggi noi diamo alle donne in post-menopausa gli estrogeni come terapia di sostituzione ormonale.

Adriana Maggi :

We know that oestrogens have positive but also negative effects. With this new drug, we hope that hormone replacement therapy will become more efficient and safer

Ma sappiamo che gli estrogeni hanno effetti benefici ed effetti indesiderati. Noi speriamo che con questo nuovo farmaco si possa avere una terapia di sostituzione ormonale più efficace ma anche più sicura.

Sujet PLEDD

10 :07 :52:00

Richard Friend :

if our project were an animal I think it would be a rat because the rat is the only animal apart from the human being which has inhabited all six continents and our technology I feel is pervasive, it will be everywhere. So it is the rat.

Richard Friend :

If our project were a tool it would be a paint brush because it is the idea that we can put with great precision the material we want exactly the right place.

Richard Friend :

if our project were a present I would ask for a complete painting set because we can create anything that our imagination can create in our mind by assembling our polymers in many different ways.

10:08:51:00

THE TEAMS

Richard Friend :

My name is Richard Friend I am a Professor of Physics at the University of Cambridge and I'm project coordinator for Polymer Light-Emitting Diodes for Displays

10:09 02 00

Map off voice:

This research has gathered teams from the Chancellor, Masters and Scholars of the University of Cambridge, Cambridge Display Technology, Materia Nova in Mons, the Linköping University, Philips Electronics in Eindhoven, and Covion in Frankfurt.

10:09:26:20

THE RESEARCH:

Richard Friend :

we've created plastics or polymers which behave as semiconductors and actually allow us to make very good light emitting diodes which we can then use for displays.

10:09:48:24

THE METHOD :

Richard Friend :

we start with a bottle of solution of the light emitting polymer, and if you look at a bottle it will look as though it is fluorescent paint; and we take some of that liquid and we coat it onto the bottom substrate and allow the solvent to evaporate off; we then put down the top layer of metals which we evaporate in a vacuum, and then we have made this sandwich of metal, polymer, semiconductor, metal, which we then have to encapsulate to keep the air out of it and then we wire it up with putting a voltage between the bottom and the top electrodes and we measure the light as it comes out.

10:10:37:00

THE RESULTS :

Richard Friend :

The novelty in our research is in two areas. First the effects from the materials, we've discovered that this whole class of plastics can function as semiconductors and we can make real semiconductor light emitting diodes with them

Richard Friend :

and second the whole manufacturing technology for depositing these diodes in factor for the surface of the display is completely new in the context of semi conductor manufacturing.

Richard Friend :

The idea that we can treat semiconductor as paint which we can coat or even print is completely revolutionary in the area of semiconductors.

Richard Friend :

and in the future these will be used for television displays, for computer displays, for perhaps flexible displays on hand hold objects, they will become ubiquitous.

Sujet THAMS

10 :11 :33 :05

Gerassimos Papadopoulos :

If my research was an animal, it would be a good watch dog

Gerassimos Papadopoulos :

I can imagine a switch which, when it's on, protects society and when it's off, exposes it to danger

Gerassimos Papadopoulos :

If my research were a present, because it protects from danger.

10 :12 :14 :15

THE TEAMS:

Gerassimos Papadopoulos :

Hello, my name is Gerassimos Papadopoulos. I am the Director of Research at the Geodynamics Institute of the National Observatory of Athens.

Gerassimos Papadopoulos :

I am responsible for the co-ordination of the proposal submitted to the European on reducing hazards due to tsunamis on the European continent.

10:12 32 00

Map off voice:

This research has gathered teams from the National Observatory of Athens, the Middle East Technical University in Ankara, the University of Bologna, and the Tohoku University in Sendai.

10 :12 :55 :07

THE RESEARCH :

Gerassimos Papadopoulos :

One of the most important phenomena resulting from earthquakes are tsunamis, i.e. huge waves caused by submarine earthquakes which create extensive damages to coastal zones.

Gerassimos Papadopoulos :

The height of the wave in the open sea is rather small, usually under five meters.

Gerassimos Papadopoulos :

However, when the wave reaches the coastal line and as its speed decreases, it becomes higher and can reach ten, twenty or even thirty meters and sometimes more.

Gerassimos Papadopoulos :

Therefore it is easy to understand how destructive these waves can be for the coastal lines they attack.

10 :13 :36 :13

THE METHOD :

Gerassimos Papadopoulos :

There are three main methods for tsunamis. First of all, using seismographs, we attempt to observe the phenomena.

Gerassimos Papadopoulos :

The signals will be analyzed with a dedicated software which, within only a few seconds, within 30 seconds, will enable us to know where the earthquake occurred, how big it was, and where it is likely to result in a tsunami.

Gerassimos Papadopoulos :

The second method is a background study of areas in which tsunamis have been known to in the past and an assessment of the risk factor.

Gerassimos Papadopoulos :

Here we carried out an excavation and located three paleo-tsunamis that hit the area of Itea in the past.

Gerassimos Papadopoulos :

We dug a ditch, of approximately 6-7 meters long, by one-meter wide, and located three successive layers of sea sand that corresponded to three older tsunamis that hit the area and flooded the entire coastal zone.

Gerassimos Papadopoulos :

And finally the third way is to find ways to ultimately minimize the hazard, by informing the population, mapping the hazard as it is distributed in each area and then finding ways of informing the authorities of adequate preventive measures to adopt in order to minimize the hazard.

10:15:07:23

THE RESULTS :

Gerassimos Papadopoulos :

In recent years we have had substantially important results. For instance, we have managed to locate older huge tsunamis that hit coastal lines in many areas of the Mediterranean sea. This knowledge is extremely valuable and makes it easier for us to define then the hazard.

Sujet AGENTCITIES

10 :15 :34 :05

Ulises Cortes :

If it were an animal, it would be a unicorn. For it's a magical animal that we all chase, and it's only through such an innocent fantasy that our dreams can come true.

Si fuera un animal, este animal sería un unicornio. Porque es un animal mágico que todos perseguimos y solamente a través de una visión virginal podemos alcanzar ese futuro.

Patricia Charlton :

If it was a tool, it would be a Swiss Army knife because it has many components and aspects and uses in the software world and in the Internet world.

Ulises Cortes :

If I were a gift, I'd be a tree. A fruit-yielding tree.

Si fuese un regalo sería un árbol. Un árbol que diese frutos .

10 :116:17:00

THE TEAMS :

Ulises Cortes :

My name is Ulises Cortés and I'm the co-ordinator of AgentCities' «Descartes 2003» project.

Mi nombre es Ulises Cortés y soy el coordinador de la propuesta de "Descartes 2003" de Agent City.

10 :16 :26 :04

Ulises Cortes :

I'm on this project for I believe it's an opportunity to ultimately build new intelligent machines that can communicate with each other and develop new helpful services for the general public.

Elegí trabajar en este proyecto porque creo que es una oportunidad para construir nuevas formas para que las máquinas inteligentes se

comuniquen entre ellas y así generar nuevos servicios que ayudan a los ciudadanos.

10:16 39 00

Map off voice:

This research has gathered teams from the Technical University of Catalonia, Motorola in Gif sur Yvette, the ADETTI in Lisbon, Btexact in London, the University of Bath, the University of Liverpool, the German Research Center for Artificial Intelligence in Saarbrücken, the Swiss Federal Institute of Technology in Lausanne, the University of Geneva, the Whitestein Technologies in Zurich, the University of Girona, the University Rovira I Virgili in Taragona, the University of Parma, the Fujitsu Laboratories in Sunnywale, the Hewlett-Packard Laboratories in Paolo Alto, the University of Maryland in Baltimore, Comtec in Sandaï, the RMIT University in Melbourne, and the University of Otago in Dunedin

10 :17 :51:00

THE RESEARCH :

Ulises Cortes :

The day-to-day set-up of a market, as you can see, requires a great many substructures supplied by a number of players.

La preparación diaria de un mercado, como ven aquí, requieren de muchas infraestructuras que se van prestando por distintos actores.

Steven Wilmott :

Agentcities creates this type of market environment by representing the users and the traders as autonomous entities. And they can find each

other across the Internet, and they can negotiate in complex ways, and adapt and personalize the service to the user's needs.

Patricia Charlton :

Today services on the Internet cannot communicate with each other. What Agentcities does is it enables the services to talk with each other, bringing the Internet alive and creating a market-like place.

10:18:29:07

THE METHOD :

Steven Wilmott :

One of the hardest problems to solve when you're trying to link computer systems over the Internet is how do you make them communicate. So, if you have a piece of software in one company and a piece of software in another company, they have to exchange messages. And normally the way to do this is for programmers to agree on a particular way...some code, a sequence of ones and zeros or another language to communicate. But the problem with that is that those programmers know how it works, but perhaps somebody else won't. So, in Agentcities what we've done is we've taken a model of conversation, based a little bit on human language, and the notion of semantics and meaning for each messages in the communication.

Ulises Cortes :

Most of the work lies in the development of protocols which enable messages to be sent and understood in such a way that they create synergy between different services.

el mayor trabajo es en la creación de protocolos que permiten el paso de mensajes y comprensión de tal forma que se puedan construir alianzas dinámicas entre servicios.

Steven Wilmott :

So, for example, the group in Tarragona, which you see here, they built systems in the areas of healthcare and also in tourism which run on PDAs, which run laptops, and are able to connect to the network. And the real difference between the systems that have been built in this way is that they can connect to different data sources dynamically and discover each other in the network.

10 :19 :35:00

THE RESULTS :

Ulises Cortes :

So far, the most significant results of our research have been that we now have at our disposal an experimental test bed consisting of nodes distributed all around the world,. From this springs a raft of services which work together in synergy using techniques borrowed from Artificial Intelligence.

Los resultados más importantes de la investigación que se ha realizado hasta ahora son disponer de un banco de pruebas formado por nodos que están distribuidos al rededor de todo el mundo y a partir de él, un conjunto de servicios que prestan servicios y se conectan entre ellos de forma dinámica utilizando técnicas que provienen de la inteligencia artificial.

Sujet NUTATION

10:20:01:06

Véronique Dehant :

If our project were an animal it would be an impala, because of the phenomenal leap in accuracy we've made with the new model.

si notre projet était un animal, ce serait un impala, un impala, pour le saut prodigieux que l'on a fait dans la précision avec le nouveau modèle.

Véronique Dehant :

If our research were a tool it would be a bolt. Because bolts are a vital part of an engine but you don't notice them.

Si notre recherche était un outil, ce serait un boulon. Parce que le boulon est une pièce maîtresse indispensable qu'on ne voit pas dans un moteur

Véronique Dehant :

If our project were a gift it would be a Rubik's cube, because it goes from one pattern to another, from one reality to another.

Si notre projet était un cadeau ce serait un “ rubiks cube ”, parce que le rubiks cube passe d’une forme à une autre , une transformation d’une situation à une autre

10 :20 :51:00

THE TEAMS :

Véronique Dehant :

Hello, my name is Véronique Dehant, and I'm the coordinator of the nutation project.

Bonjour, je m'appelle Véronique Dehant et je suis le coordinateur du projet nutation.

10:20:56:00

Map off voice:

This research has gathered teams from
the Royal Observatory of Belgium in Brussels,
the BIPM in Sèvres,
the Observatory of Paris,
the IMCCE in Paris,
the Space Research Centre of the Polish Academy of Sciences in Warsaw,
the University of Valladolid,
the University of Alicante,
the Complutense University of Madrid,
the University of Dresden,
the University of Munich,
the Geoforschungszentrum in Potsdam,
the Technical University of Vienna,
the Academy of Sciences of the Czech Republic in Ondrejov,
the National Academy of Sciences of Ukraine in Kiev,
and the Moscow State University.

10 :21 49:00

THE RESEARCH :

Véronique Dehant :

The aim of this research is to develop a model of nutation, a new model of the variations in the Earth's inclination in space. These variations are

periodic, and are caused mainly by the effect the gravitational attraction that the Moon and the Sun have on the Earth.

Le sujet de cette recherche est de créer un modèle de nutation, un nouveau modèle des variations de l'orientation de la terre dans l'espace. Ces variations sont périodiques et dues à l'attraction gravitationnelle de la lune et du soleil, principalement, qui agissent sur la Terre.

Véronique Dehant :

The Earth responds to this external forcing, so we need good models of the inside of the Earth, and the geophysical fluids on the surface of the Earth, such as the oceans and the atmosphere.

La Terre répond à ce forçage extérieur et il s'agit de bien modéliser l'intérieur de la terre de même que les effets des fluides géophysiques à la surface de la terre, comme l'océan et l'atmosphère.

10:22:20:22

THE METHOD :

Véronique Dehant :

This is a well-known phenomenon which leads to the Earth's axis wobbling by around 600 metres at the poles.

C'est un phénomène qui est bien connu dont l'amplitude correspond à un déplacement de l'axe au niveau des pôles, d'environ 600 mètres.

Véronique Dehant :

The sort of accuracy we need today is around one centimetre, whereas in 1980, when the old model was being used, the kind of accuracy we had, was more in the region of 10-20 metres.

La précision que l'on demande à l'heure actuelle est de l'ordre du centimètre, et en 1980, lorsque l'ancien modèle était utilisé, on n'arrivait pas à cette précision, c'était une précision de l'ordre de 10 à 20 mètres.

Véronique Dehant :

We had to take into account other phenomena beyond the attraction of the Moon and the Sun. We had to take other planets into account.

Il fallait s'intéresser à d'autres phénomènes que simplement l'attraction de la Lune et du Soleil. Les autres planètes étaient à considérer.

Véronique Dehant :

But we also had to reconsider the inside of the Earth, get a better understanding of what's happening there, and work on the way in which the oceans and the atmosphere interact with the solid Earth.

Mais pas seulement ça, il fallait revoir l'intérieur de la Terre, mieux comprendre ce qu'il se passait au niveau de l'intérieur de notre planète, mais aussi travailler au niveau de l'interaction des océans avec la Terre solide et de l'atmosphère avec la Terre solide.

Véronique Dehant :

So all these corrections enabled us to develop a new model which is comparable to that of current observations.

Alors l'ensemble de toutes ces corrections ont permis d'établir un nouveau modèle, avec une précision comparable à celle des observations à l'heure actuelle.

Véronique Dehant :

The model has been adopted by the international astronomical union in 2000, and recently by the geophysicists in July 2003.

Le modèle a été adopté déjà par l'union astronomique en l'an 2000 et par les géophysiciens récemment en juillet 2003.

10 :23 :34:00

THE RESULTS :

Véronique Dehant :

The nutation model will mainly be of use to astronomers. When astronomers observe stars they need a fixed reference frame, hence the nutation model.

Le modèle de nutation va principalement bénéficier aux astronomes, les astronomes qui observent les étoiles ont besoin, de se positionner par rapport à l'espace et donc ils ont besoin du modèle de nutation.

Véronique Dehant :

The same applies to the geophysicists and engineers who launch space probes. For the general public it means better navigation systems, both for GPS and for the future European system, GALILEO.

il en va de même pour les géophysiciens et les ingénieurs qui vont envoyer des sondes spatiales dans l'espace. Pour " le monsieur tout le

monde ”, c’est le système de navigation qui se verra amélioré, le système GPS ou le futur système européen : GALILEO.

Sujet EUROSECRETASE

10 :24 :10:00

Bart de Strooper:

If my project was an animal then it would be a mouse, because it actually is a mouse.

Als mijn project een dier was dan zou het een muis zijn, want het is eigenlijk een muis.

Paul Saftig :

If it were a tool it would be a pair of pliers, because as in science, pliers are used to bring hidden things to the surface.

Wenn es ein Werkzeug wäre, dann wäre es vielleicht eine Zange, weil man mit einer Zange – genauso wie man es in der Wissenschaft versteht – verborgene Dinge an die Oberfläche zu holen.

Paul Saftig :

If it were a present it would be a football, because football is a team sport and our research is a team effort.

Wenn es ein Geschenk wäre, wäre es vielleicht ein Fussball, weil ein Fussball ist ein typisches Spielgerät für einen Teamsport und unsere Forschung eine Teamleistung.

10:24:46:02

THE TEAMS :

Bart de Strooper:

I am Bart de Strooper and I work with Paul Saftig on the EUROSECRETASE project.

10:24 54 00

Map off voice:

This research has gathered teams from the Catholic University of Leuven and the Christian-Albrechts-University of Kiel.

10 :25 :04:00

THE RESEARCH :

Bart de Strooper:

Alzheimer's disease is a problem in the brain and is characterized by an accumulation of proteins in two harmful forms: namely, amyloid plaques and neuronal tangles. And what we want to find out is how they begin to form.

de ziekte van Alzheimer is een probleem in de hersenen en het word gecaracteriseerd door de afzetting van proteïne materiaal in twee soorten letsels ; namelijk de ameloide plakkers en de neuronale tangen. En wat wij willen onderzoeken is hoe die letsels ontstaan.

Paul Saftig :

In the cells we have these molecules, represented here in a very simplified form, which can be very abundant. This is the amyloid precursor protein.

in den Ohaben wir diese Moleküle, die hier sehr sehr vereinfacht dargestellt sind jetzt vorliegen, zum Teil in großer Menge. Das ist das sogenannte Amyloidvorläuferprotein

Paul Saftig :

Here proteases are symbolized by scissors. They are in effect no more than molecular scissors.

Protease sind hier einfach symbolisiert als Scheren, letztendlich sind es nichts anders als molekulare Scheren.

Paul Saftig :

First there is a cut
Zunächste gibt es einen Schnitt

Paul Saftig :

and then a second one, acting at another end,
und dann folgt ein zweiter Schnitt der an einem anderen Ende ansetzt,

Paul Saftig :

and thus I can extract the amyloid peptide.
und dann bekomme ich dieses amyloide Peptid hinaus.

Paul Saftig :

The situation is a little more complicated as we have a third pair of scissors which inhibits the peptide formation. It splits the precursor protein in the middle, but can also break up single proteins in a similar manner.

Die Situation ist noch ein bißchen komplizierter, weil wir eine dritte Schere haben, die dieses Peptid, dieser Peptidentstehung entgegen wirkt. In dem es nämlich einmal diese Vorläuferprotein in der Mitte durchtrennt, aber auch einzelne Peptide entsprechend zerkleinern kann

Bart de Strooper:

when we began, we knew that the amyloid peptide accumulates in the brains of patients with Alzheimer, and formed amyloid plaques.
wat we wisten als ons onderzoek begon is dat de hersenen van van patienten van alzheime het ameloide peptide zich opstapelt en daar ameloide plakken vormd.

Bart de Strooper:

So in theory, we should be able to slightly reduce the production of the peptide, which would compensate for the body's reduced ability to eliminate it.

Dus in principe kan men de productie een klein beetje verminderen, zodanig dat de verminderde opras functie gecompenseert word door een verminderde productie van het peptide.

Bart de Strooper:

that is in fact the main aim now, as we search for drugs to act on these clusters to slightly lessen their activity, but not so much as to obstruct other physiological processes.

En dat is in feite het groote doel nu als we geneesmiddelen voor deze scharen aan het zoeken zijn, dat is de activiteit een beetje naar beneden

brengen maar niet zoveel zodat andere fysiologische processen hierdoor niet gehinderd worden

10:26 :40:00

THE METHOD :

Paul Saftig :

Our “pets” are mice; and we work with mice. More precisely we use genetically modified mice and produce knock-out mice :

Unsere Haustiere sind Mäuse und wir arbeiten mit Mäusen, besser gesagt mit genetisch veränderten Mäusen und wir erzeugen sogenannte knock-out Mäuse:

Paul Saftig :

in whom we have deliberately switched-off one gene. The genes we switched-off are genes that are involved in the cutting-out of the amyloid peptide.

Knock-out Mäuse sind Mäuse, denen man gezielt ein Gen ausgeschaltet hat und die Gene, die wir ausgeschaltet haben sind Gene die bei dem Herausschneiden dieses Amyloidpeptids beteiligt sind.

Bart de Strooper:

The other important technological advance is being able to derive primary brain cell cultures from embryos.

en de tweede belangrijke techniek is het afleiden van primaire hersencel culturen van embryos.

Paul Saftig :

These are the nerve cells; and we study the nerve cells of those mice. In these nerve cells the toxic, poisonous β -amyloid is formed.

Das sind die Nervenzellen und die Nervenzellen dieser Mäuse studieren wir. In diesen Nervenzellen kommt es letztendlich zur Entstehung dieser toxischen, dieser giftigen β -Amyloide.

10:27:16:00
THE RESULTS

Bart de Strooper:

Initially, the pharmaceutical industry should benefit from our research, because our insights indicate which direction should be taken to develop new drugs for Alzheimer's disease.

In de eerste plaats zou de farmaceutische wereld van ons onderzoek kunnen profiteren, omdat onze inzichten een richting aangegeven heeft om nieuwe medicatie voor de ziekte van Alzheimer te ontwikkelen.

Bart de Strooper:

In the longer term, we hope that society as a whole can benefit from our research, because a new drug for Alzheimer's disease would be an enormous contribution to public health.

En op langere termijn hopen wij natuurlijk dat de ganze maatschappij van ons onderzoek kan profiteren, omdat een nieuw geneesmiddel tegen de ziekte van Alzheimer een enorme bijdragen aan de volksgezondheid zou zijn

Sujet MOB

10:27:44:00

Alan Morris :

I would claim it's a horse because a horse is multifunctional, it can pull things, it can carry people, and I suppose at the end of the day you can eat it.

Alan Morris :

I think I would put it down as my electric drill at home because it's multi speed, I can change the speed as I wish, it's portable so I can carry it around and I can add lots of tools when I think it's appropriate to do so.

Alan Morris :

It's a Russian mamma doll, which is multilayered, if you take the top off there's another one inside, if you take that off there another one, that's what modern design is like, it's multifaceted

10:28:32:15

THE TEAMS :

Alan Morris :

I'm Alan Morris and the project I'm responsible for is called MOB which is applying multi-disciplinary design to the distributed process and focused on the blended-wing body aircraft.

10:28 47:00

Map off voice:

This research has gathered teams from the Cranfield University in Bedford, QinetiQ Limited in Farnborough, the Central Laboratory of the Research Councils in Didcot, BAE Systems in Preston, the Delft University of Technology, the National aerospace laboratory in Marknesse, SAAB in Linköping, the Royal Institute of Technology in Stockholm, the German Aerospace Center in Göttingen, EADS in Munich, the Technical University of Braunschweig, the Technical University of Munich, the University of Siegen, the University of Stuttgart, and the Technical University of Berlin.

10:29:38:18

THE RESEARCH :

Alan Morris :

it's trying to create methods to allow people who are doing extremely complicated design to be able to work in an organic manner so that as the problem becomes more complicated they can bring more tools to

bear and they can draw in more specialists so that the process is dynamic and this is different from the way people have done it in the past.

Alan Morris :

and then the secondary piece of research really was to explore whether when we look at twenty twenty this new concept of the blended wing body would be a good solution to the kind of difficulties that we now foresee

10:30:16:03

THE METHOD :

Alan Morris :

so it was a step by step process; we started off first of all looking at the design as a fairly simple activity bringing in an appropriate methodology for handling that problem using the right kind of specialists and then we moved forward again increasing that level of complexity but using the design as a driver

Gianfranco Larocca :

the aircraft is not just a drawing like you see here but it's a set of engineering rules it's like the knowledge that you need to be able to design such aircraft

Alan Morris :

so we might start off looking at perhaps the structure as the first bit then looking at the structure and the aerodynamics as the second bit and then gradually increasing this level of interaction until we got to the end point where the whole complex activity could be drawn together by... under this methodology. That was the way that we progressed.

10:31:15:13

THE RESULTS :

Alan Morris :

it will benefit companies, organisations which are involved in advanced innovative design which is distributed in nature if you are creating an

entirely new car, an electric car this is where our method will come into play it will also help people who want to operate any way in a distributed environment so young engineers who want to learn how to work at the European level can follow our example.

CONCLUSION

10:31 48 00

Commentary:

The winners of the 2003 Descartes Prize, an award for scientific excellence on the initiative of the European Commission, were selected from among these eight projects.

10:31:58:00

Générique de fin