

Japanese Nobel Laureate

Dr Shinya Yamanaka was awarded the 2012 Nobel Prize in Physiology or Medicine, becoming Japan's 19th Nobel laureate.

Dr Yamanaka of Kyoto University received the prize for the discovery that mature cells can be reprogrammed to become pluripotent (a biological term meaning 'capable of giving rise to several different cell types'). The co-winner of the 2012 prize was Sir John B. Gurdon (Cambridge University).

Dr Yamanaka created induced pluripotent stem (iPS) cells—in 2006 he announced the generation of mouse iPS cells and in 2007 human

Gurdon, done half a century ago in 1962 (coincidentally the year of Dr Yamanaka's birth). Dr Gurdon showed it was possible to clone tadpoles from adult cells, overturning the accepted science of the day.

In an interview with Nobelprize.org's Adam Smith, Dr Yamanaka recognised the key role of Dr Gurdon's experiments in enabling him to conduct his own research. He said that the honour he felt receiving the



Dr Shinya Yamanaka, Director of the Center for iPS Cell Research and Application (CIRA) at Kyoto University, here in his CIRA office. He is also a senior investigator at the Gladstone Institute of Cardiovascular Disease in San Francisco.

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iPS cells. iPS cells can be made to become different kinds of mature cells as embryonic stem cells can, but the iPS cells do not pose the same ethical issues. iPS technology has enormous potential for therapeutic medicine. Even now, the ability to reprogram cells is being used in research on disease in labs around the world.

While it might seem that Dr Yamanaka's research was recognised quite early by the Nobel organisation, the iPS technology actually builds on work by co-winner

Nobel Prize was even greater when he learnt he was to share the prize with Dr Gurdon.

When asked what his greatest hopes for stem cell technologies are, Dr Yamanaka responded that having worked as a surgeon before going into research, he still feels he is a doctor and wants to help patients, saying: "So my goal, all my life, is to bring this technology ... to the bedside, to patients, to clinics".

Shinya Yamanaka - Interview, conducted 8/10/2012
www.nobelprize.org/nobel_prizes/medicine/laureates/2012/yamanaka-telephone.html, accessed 12/11/2012

Japan's Nobel Laureates:

- Hideki Yukawa: 1949 Physics • Shinichiro Tomonaga: 1965 Physics
- Yasunari Kawabata: 1968 Literature • Leo Esaki: 1973 Physics
- Eisaku Sato: 1974 Peace • Kenichi Fukui: 1981 Chemistry • Susumu Tonegawa: 1987 Physiology or Medicine • Kenzaburo Oe: 1994 Literature • Hideki Shirakawa: 2000 Chemistry • Ryoji Noyori: 2001 Chemistry • Masatoshi Koshiba: 2002 Physics • Koichi Tanaka: 2002 Chemistry • Osamu Shimomura: 2008 Chemistry • Makoto Kobayashi: 2008 Physics • Hideki Maskawa: 2008 Physics • Yoichiro Nambu: 2008 Physics • Eiichi Negishi: 2010 Chemistry • Akira Suzuki: 2010 Chemistry • Shinya Yamanaka: 2012 Physiology or Medicine



瀬戸内海 Seto Naikai—Japan's Inland Sea

Seto Naikai 瀬戸内海 is the name of Japan's largest inland sea—the Seto Inland Sea. This 450km-long body of water lies between three of Japan's main islands, Kyushu, Honshu and Shikoku. Connected through two straits to the Pacific Ocean and one to the Sea of Japan, the Seto Inland Sea has long been an important domestic and international trading route.

Before the advent of the Sanyo Main Line, a key line on today's excellent railway network, the Seto Inland Sea was the main transportation link between the island of Kyushu and the thriving economic hub of Kansai. The importance rivers and canals once played in this network can still be glimpsed in picturesque locations such as Kurashiki (g), in Okayama Prefecture.

A trip around Japan's Inland Sea makes you realise just how true it is to call Japan an island nation. The country's link to the sea can be seen in the numerous small fishing towns, such as Shimotsui in Okayama pictured here (a), and the larger trading ports, the biggest being the international port of Kobe (b).

Bridges conquering space

A series of three bridges spans across larger islands within the sea to connect the main Honshu and Shikoku islands. One of these bridges is the Great Seto Bridge (c) which seems to conquer sea and land as it makes its way across the Seto Inland Sea. These bridges are impressive spans that show the best of Japan's advanced engineering. A much older bridge is the graceful Kintai Bridge (d) in the city of Iwakuni which sits on the Seto Inland Sea coast of Yamaguchi Prefecture, spanning the Nishiki River before draining into the Seto Inland Sea. Along with Nihonbashi in Tokyo and Meganebashi in Nagasaki, Kintai Bridge is traditionally considered one

For more information

Japan National Tourist Organisation—www.jnto.org.au—a great starting place whenever planning a trip to Japan.

National Parks of Japan—Setonaikai www.env.go.jp/en/nature/nps/park/parks/setonaikai.html—an introduction to the park and its renowned islands.

World Heritages in Japan—www.jnto.go.jp/eng/location/interests/index_th_03.html—how to get to and what to see at Itsukushima and Hiroshima

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of the three most famous bridges in Japan.

Walking over the Kintai Bridge is a novel experience as you climb and descend the five beautiful but quite steep arches. Of the Seto Inland Sea's giant modern bridges, only the westernmost has a pedestrian crossing and it will take you considerably longer to cross. It is almost 60 kilometres from Onomichi (a town famous for its photogenic port and streets) to Imabari in Ehime Prefecture.

Industrial region and national park

Being such a convenient transportation route with many excellent harbours, the Seto Inland Sea developed into a major industrial region: oil refining, steel production, petrochemicals, manufacturing and shipbuilding are major industries. With rapid industrialisation and urbanisation during the 1960s to the 1980s, pollution did affect the sea and traditional coastal landscapes were impacted.

However, as early as 1934, the beauty and importance of the area was recognised and most of its coastal area was designated as Setonaikai National Park. The sea is normally calm and the region is known for its moderate climate and fair weather. Vistas of islands and islets dotting the blue sea have long been praised for their beauty.

Manmade beauty

Natural beauty abounds but so does the manmade kind. Okayama city has one of Japan's top three traditional gardens, Korakuen; Ritsurin garden (h) in Takamatsu city has buildings which date from the early 1600s and has been designated as a place of special beauty in Japan. Benesse Art Site Naoshima is one of the newest interactions with the environment. Across three islands, the aim is to 'create special places by situating



modern art and architecture within the nature and the unique culture of the Seto Inland Sea'. The image of Yayoi Kusuma's 'Pumpkin' sculpture sitting outdoors with the Seto Inland Sea as a backdrop has already become a well known image among art lovers.

World Heritage

Probably the most famous image of the Seto Inland Sea is the splendid red torii gate of Itsukushima Shinto Shrine, better known as Miyajima (f). The shrine is a UNESCO World Heritage site and while it's easy to do as a day trip from nearby Hiroshima, it's well worthwhile staying overnight to appreciate the island and the shrine buildings that seem to float above the sea at different times of the day.

In the same year that Itsukushima was inscribed, 1996, the Peace Memorial Park with the Atomic Bomb Dome (Genbaku Dome) (e) was made a World Heritage site. As the only structure left standing in the area after the bomb, it stands as a symbol of the most destructive force of humankind and as a symbol expressing the hope for world peace and a world free of nuclear weapons.

