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What do you do when you want to boost visitor attendance to your dinosaur-dominated, Jurassic World theme park? Use DNA, from four different dinosaurs, and "in the Hammond lab" create something entirely new and fearsome.

Then ... give the new creature a name which signifies its awesome power: *Indominus rex*. At least ... that's how the story theme works in the 2015 film "Jurassic World."

So ... let's travel back in time, to the age of the dinosaurs, and meet the four interesting creatures whose DNA led to this new and ferocious predator:

- *Rugops*;
- *Carnotaurus*;
- *Giganotosaurus*;
- *Majungasaurus*.

If—contrary to plan—*Indominus rex* becomes a killing machine, we have to ask: Did she "inherit" that trait from her "ancestors?" Let's examine the question, starting with *Rugops* (ROO-gops).

What we know about this theropod, from a physical standpoint, comes from a single, nearly complete and fossilized skull. With its weak but gaping jaw and skull, *Rugops*—which means "wrinkle face"—is not a predator like the Cretaceous-Period *Spinosaurus*.



Instead, *Rugops* is a natural-born scavenger, likely waiting in the wings for what's left of a *Spinosaurus*-caught, Cretaceous-era fish known as *Onchopristis*. Living off the scraps of meals, killed by another creature, could be enough for a *Rugops*.

What does the DNA from *Rugops* contribute to *Indominus rex* ? Probably ... a massive, gaping jaw. In other words ... she isn't getting the killer streak from *Rugops*.

How about *Carnotaurus* (CAR-no-TOR-us), the "Meat Eating Bull?"



This Late-Cretaceous theropod, measuring around 25 feet long, likely roamed the plains of South America. At least, that's where palaeontologist [Jose Bonaparte](#) found amazingly in-tact fossilized remains—in Argentina—during 1985. Even its skull and skin impressions were visible once the creature's skeleton was unearthed.

Those skin impressions have caused palaeontologists to believe that *Carnotaurus* had bumps across its body. It also had projections on its skull, resembling horns, which led to its "bull" name. It is this physical feature—the two horns—which *Carnotaurus* "passed-on" to *Indomitus rex*.

From whom did *Indomitus rex* inherit her size? *Giganotosaurus* (jig-a-NOT-o-SOR-us) can take credit for that.



This “Giant Southern Lizard” lived, in South America, during the Mid-Cretaceous period. Around 40-45 feet long, the *Gigantotyrannus* weighed around 8 tons and walked—upright—on two powerfully large legs. With its thin and pointed tail providing balance, the creature was likely able to make quick turns while running.

Because of its size, *Gigantotyrannus* likely had no natural predators. Living before *T. rex*, it probably fed on herbivore dinosaurs. If so, it could have easily sliced through the flesh of its prey.

Because no complete skeleton of this creature has ever been found, paleontologists (and artists) can only speculate about [this massive creature](#) (including whether gigantic carnivores and herbivores lived at the same time.)

That leaves *Majungasaurus* (ma-JUNG-ah-SORE-us), the last of the four DNA-contributing dinosaurs. Once roaming Madagascar, in the late-Cretaceous period, this theropod likely contributed its teeth and lower torso to the lab-developed *Indominus rex*.

We know about this predator from spectacular fossils located in the Berivotra area of northwest Madagascar. Long before [lemurs](#) lived on that island, *Majungasaurus* grew to around 21 feet in length. It is the best-known of the muscular [abelisaurids](#) (which dominated the southern hemisphere just as the [tyrannosaurids](#) dominated the northern hemisphere).

*Majungasaurus* had an unusual body. Its short-but-powerful hind legs were far different from its very small front “legs.” While paleontologists are not sure about the [function of those forelimbs](#), there is little doubt about how a *Majungasaurus* used its sharp and knife-like teeth!

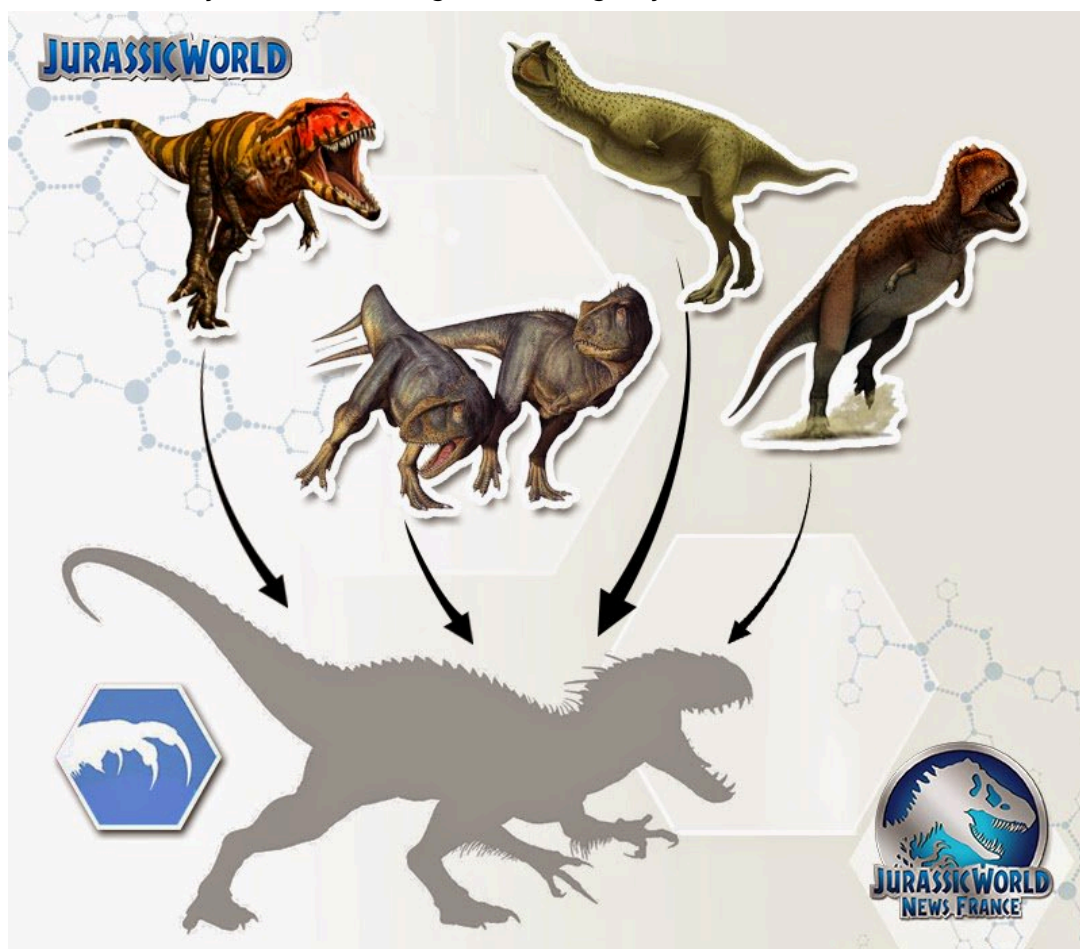
Plus ... scientists believe this dinosaur may also have been ... a cannibal. What is the evidence for that?

During 2003, in Madagascar, paleontologists found a fossilized tail bone from a *Majungasaurus*. That bone contains some interesting marks which paleontologists compared with the denticle spacings of *Majungasaurus*.



Guess what? They matched ... almost exactly!

So ... now you know the history of a 43-foot long, 18-foot high hybrid dinosaur called *I. rex* !



And ... you're equipped with the knowledge you need when the Park opens on June 12!

See Alignments to State and Common Core standards for this story online at:

<http://www.awesomestories.com/asset/AcademicAlignment/JURASSIC-WORLD-and-INDOMINUS-REX-Jurassic-Park>

See Learning Tasks for this story online at:

<http://www.awesomestories.com/asset/AcademicActivities/JURASSIC-WORLD-and-INDOMINUS-REX-Jurassic-Park>

## Indominus Rex

Meet *Indominus rex*—a lab-produced, hybrid dinosaur with some unbelievably scary traits!

Created to bolster sagging ticket sales at the Jurassic World theme park, *I. rex* was created from the DNA of four different dinosaurs:

- *Rugops*;
- *Carnotaurus*;
- *Giganotosaurus*; and
- *Majungasaurus*.

Let's examine some features of *I. rex*:

- **What does *Indominus rex* mean?** Untamable or Fierce King. In other words ... indomitable!
- **How long is *Indominus rex*?** About 40 feet (and growing).
- **Where was *Indominus rex* born?** In the Hammond Creation Lab (because it is a genetically engineered creature).
- **Where does *Indominus rex* live?** At Jurassic World.
- **How much does *I. rex* weigh?** Uncertain, but it's a lot!
- **How loud is its roar?** Between 140-160 decibels (or like the sound of a 747 taking off/landing).
- **How fast can it run?** At least 30 miles per hour, in an enclosed space.

When she breaks free from her paddock, the dinosaur with the combined-DNA reminds us of an old adage: *It's not nice to fool with Mother Nature!*

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View this asset at: <http://www.awesomestories.com/asset/view/Indominus-Rex>



## Skull of a Rugops

This image depicts the fossilized skull of a *Rugops* dinosaur as it appeared on September 14, 2014.

It is on display at the Spinosaurus Exhibit at the National Geographic Museum.

Image by Ryan Somma; online via Wikimedia Commons. License: [CC BY-SA 2.0](https://creativecommons.org/licenses/by-sa/2.0/)

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## Carnotaurus Skull Cast

This image depicts the skull cast of a *Carnotaurus*, a dinosaur whose name means "Meat Eating Bull."

The skull cast is located at the Kenosha Dinosaur Museum in Kenosha, Wisconsin.

Photo by Scott Anselmo; online via Wikimedia Commons. License: [CC BY-SA 3.0](https://creativecommons.org/licenses/by-sa/3.0/)

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## Giganotosaurus in Action

Since very few *Giganotosaurus* fossils have been discovered, how do we know about their physical characteristics? What did they look like?

From what paleontologists have found, in Argentina, we know that *Giganotosaurus* was a [carcharodontosaurid](https://en.wikipedia.org/wiki/Carcharodontosaurid). In other words, it was a giant carnivore at least as big—or bigger—than *T. rex*.

Despite its huge size, *Giganotosaurus* ran really fast. The BBC features this carcharodontosaurid in its "Planet Dinosaur" series and tells us [more about its speed](https://www.bbc.com/earth/article/giganotosaurus-how-fast-it-ran):

*The carcharodontosaurids were a group of giant carnivorous dinosaurs that rivaled and even exceeded Tyrannosaurus in size.*

*Scientists have calculated that one of them, Giganotosaurus, could run at 50 km/h, which is just slower than an ostrich, but 13 km/h faster than a gold medal-winning Olympic sprinter.*

*The BBC also reveals how Giganotosaurus may have appeared in this still shot from "Walking with Dinosaurs." Image, depicted above, from the BBC's "Walking with Dinosaurs." Copyright, BBC, all rights reserved. Image provided here as fair use for educational purposes and to acquaint new viewers/readers with the "Walking with Dinosaurs" productions.*

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## Majungasaurus Teeth

*Majungasaurus* was a theropod dinosaur who, before it became extinct, lived on the island of Madagascar. Other theropods include *Tyrannosaurus*, *Allosaurus* and *Spinosaurus*.

Fossilized *Majungasaurus* remains were uncovered near the town of Berivotra in northern Madagascar. Today a skull cast, of those remains, is publicly displayed at Chicago's Field Museum.

*Majungasaurus* is also known for its teeth. It is especially known for teeth marks which Ray Rogers and Kristi Curry Rogers found (in 2003) on other *Majungasaurus* bones. This finding has led researchers to conclude that this dinosaur may also have been a cannibal.

Click on the image for a better view.

Image of Majungasaurus teeth and bone by Ray Rogers and Kristi Curry Rogers; [online via Minnesota Public Radio](#).

View this asset at: <http://www.awesomestories.com/asset/view/Majungasaurus-Teeth>



## Indominus Rex and Her Genetic Makeup

In this image we see *Indominus Rex* and the four extinct dinosaurs whose DNA was used, by fictional scientists at the "Hammond Creation Lab" at Jurassic World, to create her.

To check out the details of these four dinosaurs in greater depth, to see their fossilized remains - and - to learn which one was most likely a cannibal, [click here](#).

Click on the image for a better view.

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## Carnotaurus and Indominus Rex

*Carnotaurus*, a theropod dinosaur which likely weighed around one ton and measured about 25 feet long, roamed the plains of South America during the Late-Cretaceous Period.

Among its features were these:

- Unusual hornlike projections on its skull
- A short, deep snout
- Stubby forelimbs with short lower arm bones
- A thick neck
- Small bumps across its body.

Only one *Carnotaurus* fossil has been found so far. It was discovered during 1985, in Argentina, by Jose Bonaparte.

Amazingly, most of the skeleton, its skull and skin impressions were unearthed. Such a detailed discovery is very rare in paleontology.

The creature's hornlike projections on its skull, resembling a bull's, led to its name—*Carnotaurus*—which means "Meat Eating Bull."

Although *Carnotaurus* resembles *T. rex*, paleontologists believe they are very distantly related theropods. In addition, the South American dinosaur had teeth which were about 7.5 times smaller than the teeth of a *T. rex*.

Most likely a faster runner than *T. rex*, *Carnotaurus* had a huge thigh muscle which comprised around 15% of its entire body weight. Paleontologists who have studied *Carnotaurus* believe it was probably a faster runner than all the other theropods.

The creature which Dr. Bonaparte found, in Argentina, likely lived in a place which was dominated by a lake or a lagoon. The climate, when *Carnotaurus* was alive, was warm but included wet-and-dry seasons.

Clip, from "Walking with Dinosaurs," online via the BBC's channel at YouTube. Copyright, BBC, all rights reserved. Clip provided here as fair use for educational purposes and to acquaint new viewers with the production.

Information about Carnotaurus from the BBC's "Walking with Dinosaurs" website, and its [page on Carnotaurus](#).

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## Giganotosaurus and Indominus Rex

*Giganotosaurus*—the “Giant Southern Lizard”—lived, in South America, during the Mid-Cretaceous period.

Around 40-45 feet long, *Giganotosaurus* weighed around 8 tons and walked—upright—on two powerfully large legs. With its thin and pointed tail providing balance, this dinosaur was likely able to make quick turns while running.

The creature had a massive skull, about the size of man. Paleontologists believe it likely had a good sense of smell and good eyesight.



Because of its enormous size, *Giganotosaurus* likely had no natural predators. Living before *T. rex*, it probably fed on herbivore dinosaurs, easily slicing through the flesh of its prey.

Because no complete skeleton of this creature has ever been found, paleontologists (and artists) can only speculate about this massive creature. Among their speculations is that *Giganotosaurus* may have hunted in packs.

Scientists working at the Jurassic World “Hammond Creation Lab”—named after the theme park’s founder, [John Hammond](#)—used the DNA of a *Giganotosaurus* to create the fearsome *Indominus rex*. What did that DNA likely contribute to *I. rex*?

Her size!

Clip from the BBC’s “Planet Dinosaur.” Copyright, BBC, all rights reserved. Clip provided here as fair use for educational purposes and to acquaint new viewers with the program. Clip online via the BBC’s channel at YouTube. Standard YouTube License.

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## Majungasaurus and Indominus Rex

Paleontologists working in [Madagascar](#) have located the fossilized remains of a dinosaur called *Majungasaurus* in the Berivotra area of [the island](#).

Using computer graphics, coupled with evidentiary information about *Majungasaurus*, the BBC features this predator in Episode 3 (“Last Killers”) of its “Planet Dinosaur” series.

The BBC tells us more about it in its YouTube channel:

*...Planet Dinosaur tells the stories of the biggest, deadliest and weirdest creatures ever to walk the Earth, using the latest fossil evidence and immersive computer graphics.*

*Narrated by John Hurt, this clip reveals something about Majungasaurus:*

*A male Majungasaurus claims the feast of a carcass as his own.*

*In the process, this predator displays cannibalistic behavior. Per the BBC:*

*The top predator in Madagascar 70 million years ago was Majungasaurus, a killer that at times would even turn into a cannibal.*

*Yikes!*

*Clip, described above, from the BBC’s “Planet Dinosaur,” Episode 3. Online via the BBC’s Channel at YouTube. Copyright, BBC, all rights reserved. License: Standard YouTube License.*

View this asset at: <http://www.awesomestories.com/asset/view/Majungasaurus-and-Indominus-Rex>





## Jurassic World Global Trailer

In the 2015-released film, "Jurassic World," the ideas which Dr. John Hammond had in "Jurassic Park" have come to pass.

People from all over the world can visit a theme park, on the fictional island of Isla Nubar—located 120 miles (190 kilometers) off the western coast of Costa Rica—to see dinosaurs and other attractions.



One of Hammond's ideas—to recreate extinct dinosaurs in a lab—has also come to pass. The consequences of trying to achieve the "wow factor," however, backfire when *Indominus rex* lives up to her indomitable name. This video is one of the global trailers for "Jurassic World."

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