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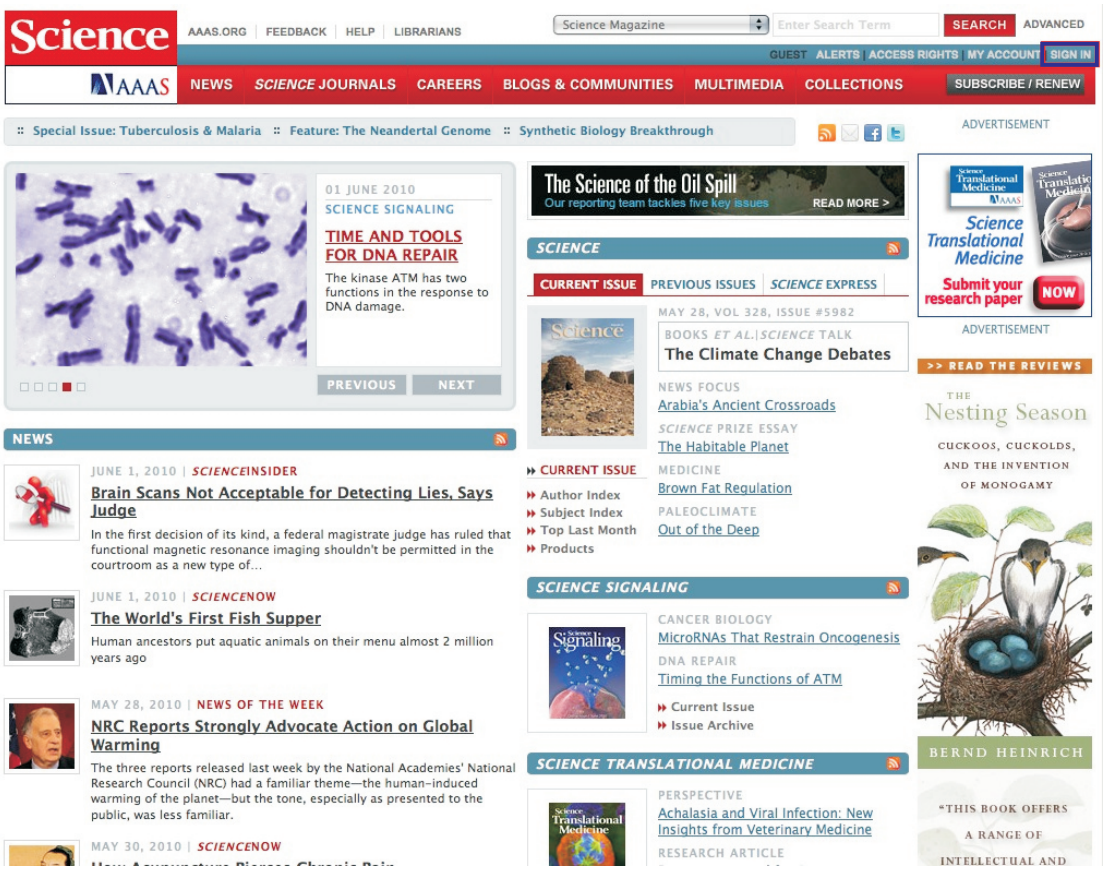
Guía del Usuario

Guía Rápida

1. Ingrese en el sitio web http://www.sciencemag.org/
2. En la página de inicio haga clic en **Sign In** en la parte superior derecha para acceder a su cuenta personal. Algunas herramientas como salvar búsquedas, solicitar alertas, etc., sólo podrán ser usadas dentro de su cuenta personal. En el apartado 16 de esta guía encontrará los pasos para crearla.

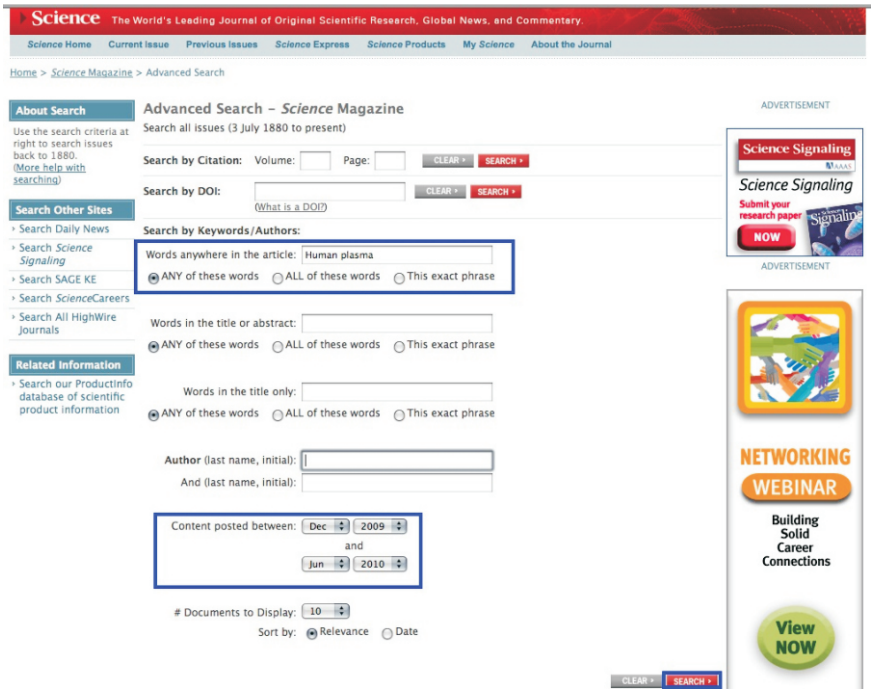


3. En la página de inicio puede realizar una **Búsqueda Simple**. Sólo ingrese el termino de búsqueda en la parte superior derecha. Del lado izquierdo se encuentra el menú de publicaciones, puede seleccionar la de su interés.

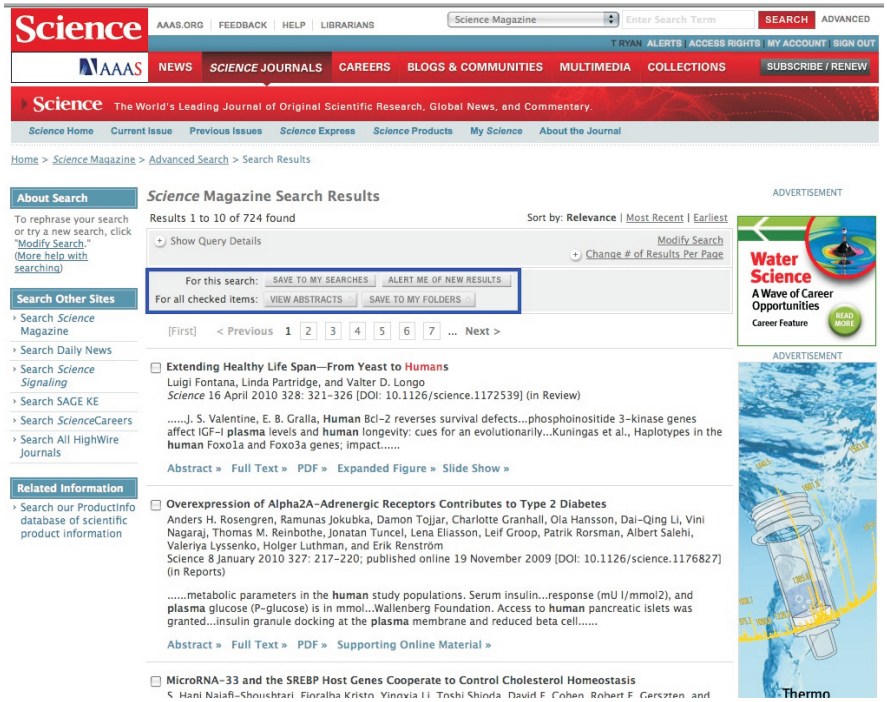
4. Haga clic en **Search** para ejecutar la búsqueda.

5. Haga clic en **Advanced**, junto al campo de **Búsqueda Simple**, para acceder a la página de **Búsqueda Avanzada**.

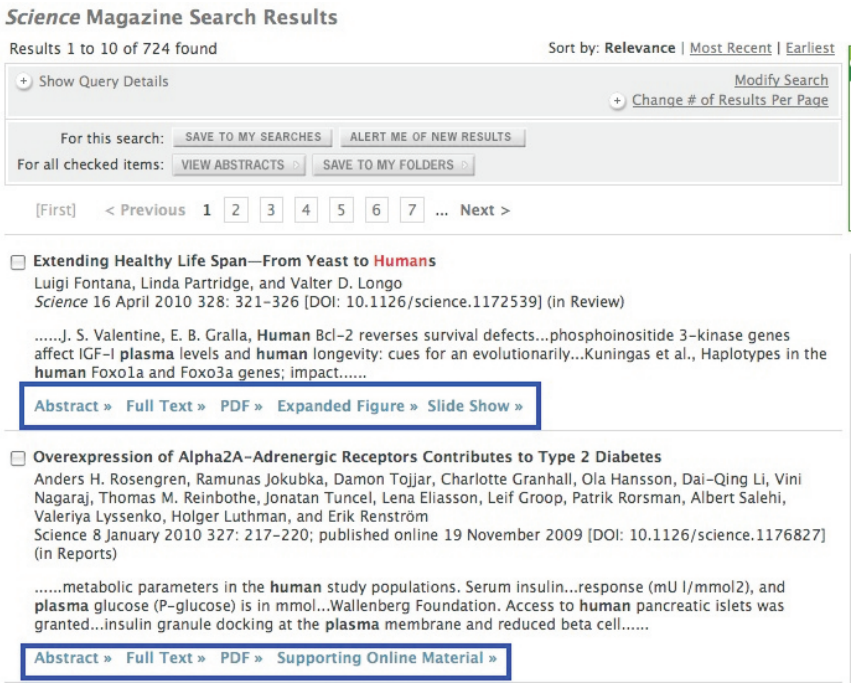
6. En la página de **Búsqueda Avanzada** ingrese el término de búsqueda o campo de interés, defina el período de tiempo y haga clic en **Search**.



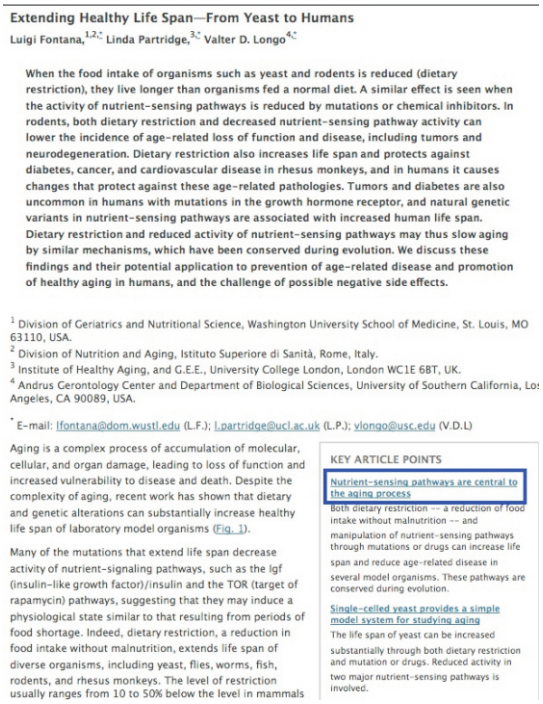
7. En la página de resultados puede observar las herramientas para guardar las búsquedas, solicitar alertas, visualizar los Abstracts de los artículos seleccionados y guardar los mismos en su carpeta personal.



8. En la página de resultados haga clic en el enlace de interés para acceder a: **Abstract, Full Text, PDF** o **Supporting Online Material.**



9. En la página del artículo a texto completo en formato **HTML** se observan los hipervínculos para referencias y figuras.



Extending Healthy Life Span—From Yeast to Humans

Luigi Fontana,[1,2,*] Linda Partridge,[3,*] Valter D. Longo[4,*]

When the food intake of organisms such as yeast and rodents is reduced (dietary restriction), they live longer than organisms fed a normal diet. A similar effect is seen when the activity of nutrient-sensing pathways is reduced by mutations or chemical inhibitors. In rodents, both dietary restriction and decreased nutrient-sensing pathway activity can lower the incidence of age-related loss of function and disease, including tumors and neurodegeneration. Dietary restriction also increases life span and protects against diabetes, cancer, and cardiovascular disease in rhesus monkeys, and in humans it causes changes that protect against these age-related pathologies. Tumors and diabetes are also uncommon in humans with mutations in the growth hormone receptor, and natural genetic variants in nutrient-sensing pathways are associated with increased human life span. Dietary restriction and reduced activity of nutrient-sensing pathways may thus slow aging by similar mechanisms, which have been conserved during evolution. We discuss these findings and their potential application to prevention of age-related disease and promotion of healthy aging in humans, and the challenge of possible negative side effects.

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Aging is a complex process of accumulation of molecular, cellular, and organ damage, leading to loss of function and increased vulnerability to disease and death. Despite the complexity of aging, recent work has shown that dietary and genetic alterations can substantially increase healthy life span of laboratory model organisms (Fig. 1).

Many of the mutations that extend life span decrease activity of nutrient-signaling pathways, such as the Igf (insulin-like growth factor)/insulin and the TOR (target of rapamycin) pathways, suggesting that they may induce a physiological state similar to that resulting from periods of food shortage. Indeed, dietary restriction, a reduction in food intake without malnutrition, extends life span of diverse organisms, including yeast, flies, worms, fish, rodents, and rhesus monkeys. The level of restriction usually ranges from 10 to 50% below the level in mammals

KEY ARTICLE POINTS

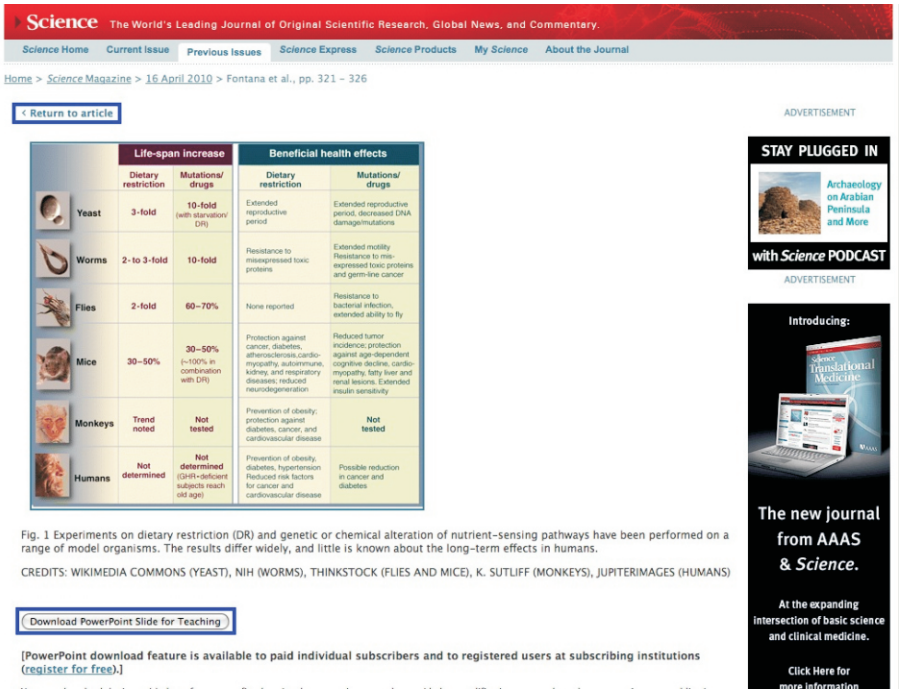
Nutrient-sensing pathways are central to the aging process

Both dietary restriction -- a reduction of food intake without malnutrition -- and manipulation of nutrient-sensing pathways through mutations or drugs can increase life span and reduce age-related disease in several model organisms. These pathways are conserved during evolution.

Single-celled yeast provides a simple model system for studying aging

The life span of yeast can be increased substantially through both dietary restriction and mutation or drugs. Reduced activity in two major nutrient-sensing pathways is involved.

10. Haga clic en una figura para visualizarla en un tamaño mayor y descárguela en su ordenador en formato **Power Point**. Para volver a la página del artículo, sólo tiene que seleccionar **Return to Article** en la parte inferior y superior de la figura.



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	Life-span increase		Beneficial health effects	
	Dietary restriction	Mutations/ drugs	Dietary restriction	Mutations/ drugs
Yeast	3-fold	10-fold (with starvation/ DR)	Extended reproductive period	Extended reproductive period, decreased DNA damage/mutations
Worms	2- to 3-fold	10-fold	Resistance to misexpressed toxic proteins	Extended motility Resistance to mis-expressed toxic proteins and germ-line cancer
Flies	2-fold	60–70%	None reported	Resistance to bacterial infection, extended ability to fly
Mice	30–50%	30–50% (<100% in combination with DR)	Protection against cancer, diabetes, atherosclerosis, cardiomyopathy, autoimmune, kidney, and respiratory diseases; reduced neurodegeneration	Reduced tumor incidence; protection against age-dependent cognitive decline, cardiomyopathy, fatty liver and renal lesions. Extended insulin sensitivity
Monkeys	Trend noted	Not tested	Prevention of obesity; protection against diabetes, cancer, and cardiovascular disease	Not tested
Humans	Not determined	Not determined (GHR-deficient subjects reach old age)	Prevention of obesity, diabetes, hypertension Reduced risk factors for cancer and cardiovascular disease	Possible reduction in cancer and diabetes

Fig. 1 Experiments on dietary restriction (DR) and genetic or chemical alteration of nutrient-sensing pathways have been performed on a range of model organisms. The results differ widely, and little is known about the long-term effects in humans.

CREDITS: WIKIMEDIA COMMONS (YEAST), NIH (WORMS), THINKSTOCK (FLIES AND MICE), K. SUTLIFF (MONKEYS), JUPITERIMAGES (HUMANS)

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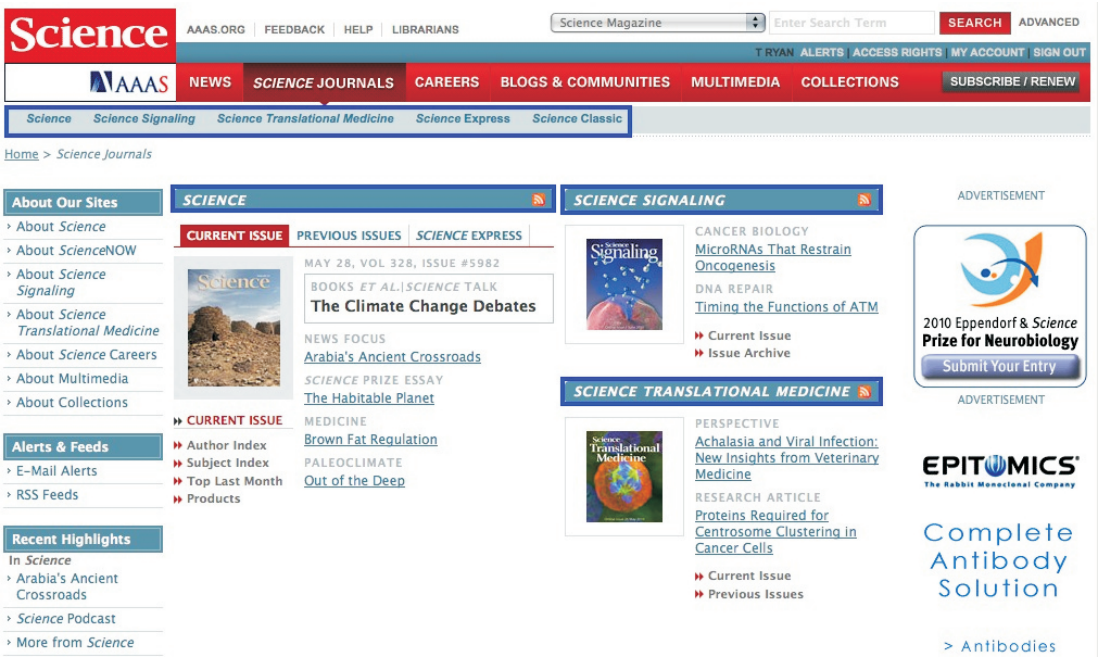
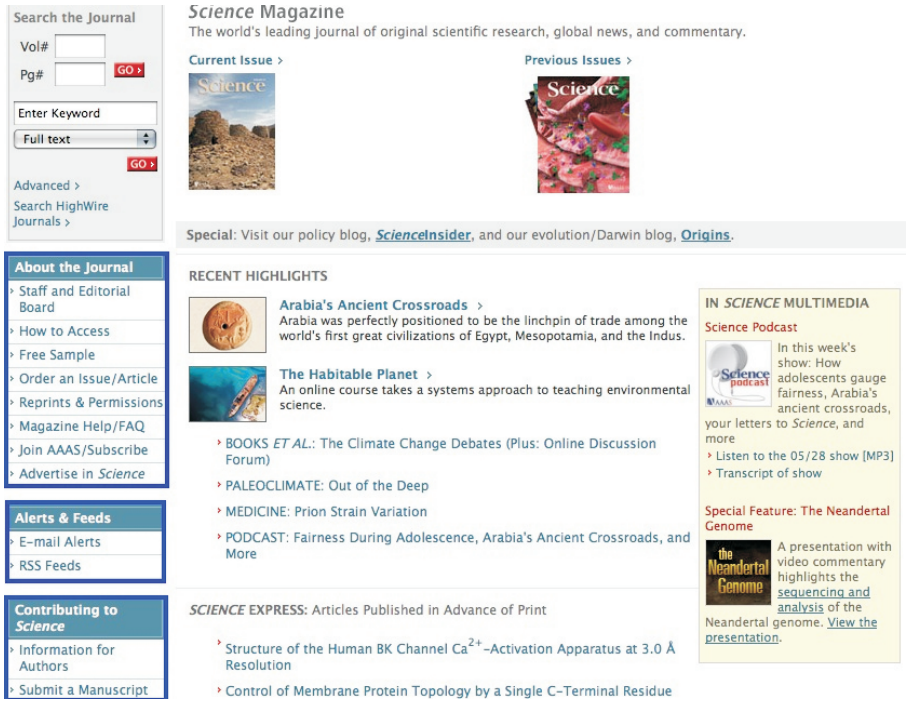
11. En la página del artículo visualice el menú lateral izquierdo. Este contiene diversas herramientas para trabajar como acceder al texto completo, guardar, descargar una citación, compartir, etc.

12. En la pestaña **Science Journals** usted tendrá acceso a cada una de las publicaciones de la familia **Science**.

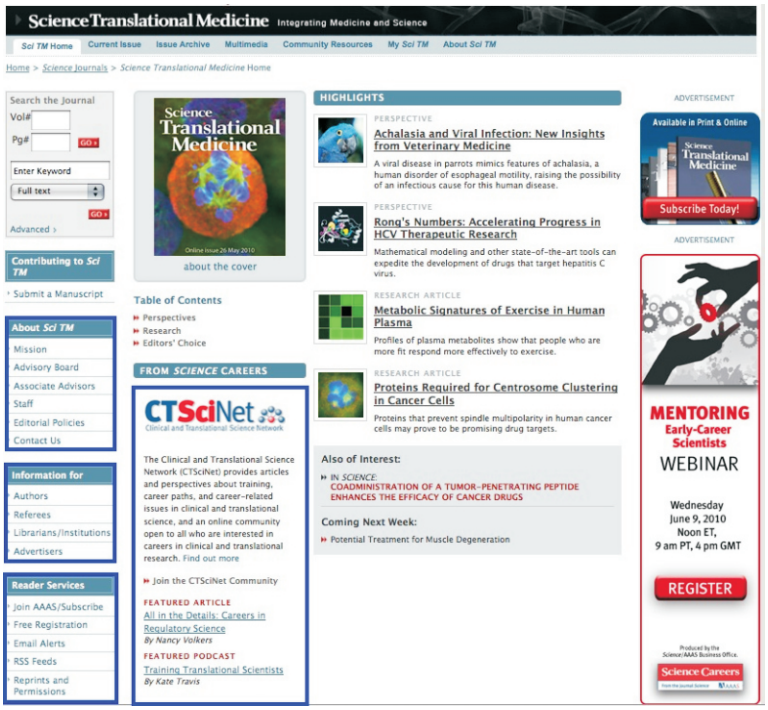


13. En la página de cada una de las publicaciones se permite el acceso al contenido del número actual de la revista, las ediciones anteriores y las herramientas disponibles, como alertas y RSS.

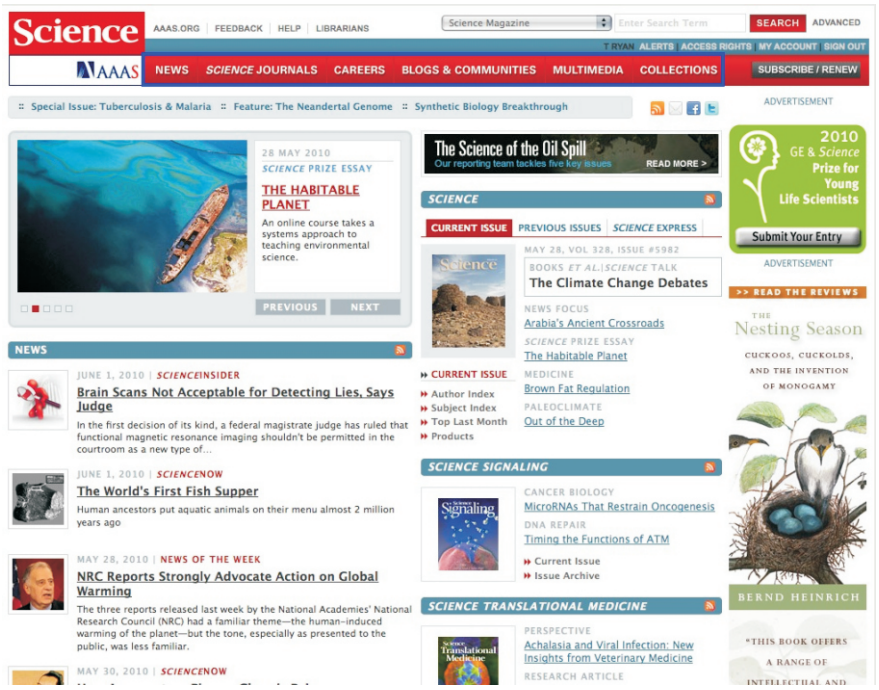


14. En la página de **Science Signaling** encontrará las mismas herramientas de **Science Magazine** y algunas más como **Connection Map**, **Resources**, etc.

15. En la página de **Science Translational Medicine** localizará las mismas herramientas disponibles en **Science Magazine**.



16. En la página principal es posible navegar por: **News, Careers, Blogs & Communities, Multimedia** y **Collections**. Todos cuentan con varios recursos.



17. En la página principal haga clic en **Subscribe/Renew** en la parte superior derecha. Postriormente seleccione **Register for Free Access to Science** en el menú lateral derecho. A continuación aparecerá una nueva página en donde debe seleccionar la opción **Register** y completar el formulario.

18. En cualquier página de se **Science** haga clic en **My Science**, en el menú superior o lateral izquierdo. Aquí tendrá acceso a sus preferencias, alertas, búsquedas guardadas, etc.