

Mushroom Council Partners with City of Hope

City of Hope, a leading research, treatment and education institution for cancer, diabetes and other life-threatening illnesses, has three research teams dedicated to investigating the effects mushrooms have on health. The California Breast Cancer Research Program, the American Institute for Cancer Research and the National Institutes of Health supported the lab studies, and the Mushroom Council recently contributed \$560,000 to support the pilot clinical trials. [Read more](#) about City of Hope research on mushrooms, which was also highlighted in the [institution's newsletter](#) last fall.



Scientists at City of Hope were some of the first to find a potential link between mushrooms and a decreased likelihood of tumor growth and development in cells and animals. Examples of City of Hope's preliminary research findings include:

- City of Hope research published in the November 2008 [Nutrition and Cancer](#) journal found that prostate tumor size and growth was decreased in mice treated with white button mushroom extract, while tumors grew in mice not treated with mushroom extract. Researchers concluded that these findings illustrated the anticancer potential of compounds in mushroom extract – both in mice and in laboratory-tested prostate cancer cells – and possibly warranted recommendation of white button mushroom as a dietary component that might aid in the prevention of prostate cancer in men.
- In vitro and in vivo research published in December 2006 in [Cancer Research](#) found that mushroom extract lowered both growth and weight of cancer tumors in Chinese hamster ovary cells and mice. Results suggest that the studies “illustrate the anticancer activity in vitro and in vivo of mushroom extract and its major fatty acid components.”
- Research published in the December 2001 issue of [Journal of Nutrition](#) found that white button mushrooms suppress a compound called aromatase, which is considered to play a role in hormone responsive breast cancer tumor development and growth. White button mushrooms suppressed aromatase in breast cancer cells in the laboratory. Lab results indicate that diets high in mushrooms may affect aromatase activity in postmenopausal women, which appears to decrease production of estrogen and play a role in chemoprevention.

Researchers at City of Hope now plan to apply this research to human clinical trials to establish whether mushrooms act as aromatase inhibitors in women. It is far too early to conclusively say whether or not humans will experience decreased tumor growth as a result of eating mushrooms. However, City of Hope and the Mushroom Council one day hope to be able to share credible science-based information that ties mushroom intake with decreased cancer risk, along with other important health benefits.

[Read more](#) about research that links mushrooms to potential health.

Mushroom News from April Experimental Biology Meeting

New mushroom research presented in April at the [Experimental Biology meeting](#) in New Orleans described mushrooms' role in enhancing **immune function**, protecting against **breast cancer** and collagen-induced **arthritis**. This research adds to the growing body of science on the nutrition and health benefits of mushrooms.

Below are summaries of the research abstracts presented by Dr. Keith Martin of Arizona State University and Dr. Solo Kuvibidila Department of Nutritional Sciences, Oklahoma State University.

- Researchers from [Arizona State University](#) found that mice that eat edible white button mushrooms may experience an added benefit due to enhancing or boosting immune function and preventing weight loss (common with disease and indicative of toxicity) when exposed to disease-causing irritants.
- [Additional research](#) from this university found that extracts of five commonly consumed mushrooms (maitake, crimini, Portabella, king oyster and white button varieties) may have properties that are related to attacking breast cancer cells. Mushroom extracts increased breast cancer cell death by 20 to 40 percent, depending on mushroom variety. This preliminary research suggests that mushroom extracts may be associated with a decreased likelihood of developing breast cancer, due to stopping the multiplication of existing cancer cells and leading to cancer cell death.
- [Oklahoma State University](#) researchers found that mice who consumed white button, shiitake or Portabella mushrooms for six weeks who also had collagen-induced arthritis (CIA) had reduced levels of one of the inflammatory markers that increases bone erosion during rheumatoid arthritis, called tumor necrosis factor alpha, by all three types of mushrooms.
- [Further research](#) from this university found that mice fed Portabella mushrooms for six weeks had reduced negative health effects common with CIA when compared to the control group: intake of the mushrooms was linked to slowed muscle protein loss and minimized thymus atrophy.

Tasteful Treasure

This delicious sandwich makes use of one of the staples of summer: the grill. Pair this veggie-filled sandwich with a refreshing green salad or with an array of fresh fruit for a satisfying summer lunch or dinner.

Grilled Philly Cheese Mushroom Sandwich

Preparation Time: 5 minutes

Cooking Time: 15 minutes

Serves: 4

Average cost per sandwich: \$2.95

4 large Portabella mushrooms, sliced
1 large red onion, sliced
2 bell peppers, core and seeds removed, quartered
2 tablespoons canola oil
1 teaspoon grilled steak seasoning
4 Italian rolls, split length wise, toasted
8 slices provolone or American cheese or 4 ounces processed cheese spread

Heat grill to medium, about 365°. Brush both sides of mushrooms, onions and bell peppers with oil and season with steak seasoning. Place on grill and close cover, cook 5 minutes on each side.

Remove onions and peppers from grill, thinly slice as desired. Place on aluminum foil and return to grill to keep warm. Remove mushrooms and thinly slice. Lightly toast bun on grill. Remove peppers, onions and mushrooms and combine.

Place cheese on each split roll, top mushroom mixture. Turn grill off and place sandwiches on grill with lid closed, 5 minutes or until cheese is fully melted. Cut in half and serve immediately.



Each serving provides: 370 calories, 23g fat (35% Daily Value), 10g saturated fat (50% Daily Value), 40mg cholesterol (13% Daily Value), 590mg sodium (25% Daily Value), 5g dietary fiber (20% Daily Value), 21g protein, 43% Daily Value for selenium, 30% Daily Value for vitamin A, 23% Daily Value for potassium, 10% Daily Value for iron, 120% Daily Value for vitamin C, 45% Daily Value for calcium.

Mushrooms and Immunity

Concerns about influenza highlight the importance of eating a balanced diet, including foods that can naturally maintain the immune system. While the science on mushrooms and immunity continues to evolve, we already know mushrooms offer a variety of nutrients associated with immunity such as selenium, vitamin D and antioxidants.

Research from the February issue of [BMC Immunology](#) and Tufts research published in [March 2008](#) and [June 2007](#) issues of the Journal of Nutrition also support the link between mushroom intake and maintaining immunity. [Read more](#) about research related to intake of mushrooms and maintaining the immune system, as well as other health benefits.

The Mushroom Council is composed of fresh market producers or importers who average more than 500,000 pounds of mushrooms produced or imported annually. The mushroom program is authorized by the Mushroom Promotion, Research and Consumer Information Act of 1990 and is administered by the Mushroom Council under the supervision of the Agricultural Marketing Service. Research and promotion programs help to expand, maintain and develop markets for individual agricultural commodities in the United States and abroad. These industry self-help programs are requested and funded by the industry groups that they serve. For more background information as well as useful recipes, tools and references, please visit www.MushroomInfo.com and our interactive blog, The Mushroom Channel (www.themushroomchannel.com).

