

A Deadly Rainbow: The Study of Mold in Student Rentals and What Can be Done About It.

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April, 2010

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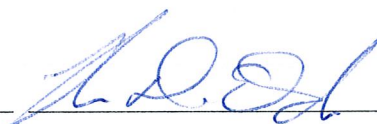
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Dr. Terrence Benschel

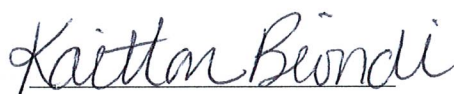
Date



Dr. Thomas Eatmon

Date

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Pledge

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Mold is an inhabitant of most homes across America, particularly those that are low rent. College students live in some of the cheapest rented houses that can be found, including those who rent in Meadville, Pennsylvania. Mold spores float around in the air until given the right conditions to feed and grow. The better the conditions found, the more mold will grow. As the amount of time spent indoors increases, the concern for indoor air quality and health rises as well. Mold lives in places that most college students do not bother to look for such as under the toilet seat and in between the shower curtains. In studies done on homes with mold and allergy troubles, there is a direct correlation between the allergy problems of the inhabitant and the amount of mold in the household. With a guidebook college students will have the opportunity to educate themselves and be able to protect their homes from mold growth and any side effects that it could cause. It has been proven that one of the biggest problems with mold induced by poor indoor air quality is the lack of education. Mold has been a problem for years, but becoming equipped with the right information could give college students a new weapon in the fight against mold.

All About Mold

1.1 The Problems with Mold

Where you live and the things that surround you can have an impact on your health and your everyday well-being. College students, for example, move out of their dorms or on campus living and begin to rent homes with friends off campus. This new location can affect your commute to class, your daily schedule, and last but certainly not least, your health. If a person is living in an environment with dangerous air quality or toxins, then this could lead to all different kinds of inconveniences. The environment in your household is one of the most important factors on your health. It was found that the average person normally spends more than 90% of their time in an indoor environment (Leech et. al, 2002). This is a significant portion of a person's life, and if the majority is spent in an environment where there is exposure to high levels of biological or chemical hazards, then this person's life could be at some point, seriously impacted by negative effects or reactions. It was found that most people in the United States are spending approximately 15.5 to 15.7 hours a day in their homes, making home indoor air quality an extremely significant factor (Brasche and Bischof, 2005). Indoor environments not only include their homes, but work places, transportation vehicles and other people's living spaces. These are the different places that a person may spend time in each day.

A study done in Seattle-King County with their Healthy Homes project researched the different allergy triggers within just the home. They conducted environmental audits to assess the different exposures and help residents find ways to fix and reduce their risk (Krieger et al., 2005). The low rent homes, which strongly resemble ones that college students reside in, saw a decrease in their asthma when measures were taken to clean up the air and the home. This could be as easy as replacing an old vacuum cleaner with one that has a high-efficiency particulate air filter or attaching a HEPA filter. A HEPA filter takes all of the allergens out of the air when in use, instead of just recirculating them back out into the air like a normal vacuum (Wu and Takaro, 2007). It is unlikely that a college student will be able to afford fixing up their home,

however a HEPA filtered vacuum cleaner is not out of a college students price range and by the end of their stay at their off campus house the vacuum cleaner will have paid for itself. In most cases it is actually the landlord's job to make sure that the housing is suitable for people to live in or their renters. This becomes one of the major barriers later on, as many of the houses that truly need fixing up are the ones that are inhabited by those who cannot afford to pay to have their homes fixed. In Meadville students are living in some of the cheapest rented homes available. The houses are by no means unlivable, however each one feels the effect of a cheap rent. For most it is inevitable that the houses will become a mess as the year progresses and a once livable space becomes home to dangerous new inhabitants. The person or persons living there may see some of these, such as mold. However, mold can also be growing in places that cannot either be seen in plain sight or are just simply overlooked. There could also be secondary sources of mold or other pollutants, which are coming in from outside of the home, creating a new set of indoor air pollutants (Mitchell et al, 2007). These pollutants can be found in the air or on objects such as side paneling on a house, which then find their way in through vents and open windows. These household hazards are problems that are perhaps, unknowingly invading the homes of college students all over America.

Within one home, there are a multitude of hazards that could be found around the living space and especially in an older home in particular. There are various threats that can be found, from the biological bacteria and viruses to the chemical hazards of environmental tobacco smoke, nitrogen, sulfur oxides and volatile organic compounds. Exposure to these different indoor air pollutants can differ depending on where the residents are located and where the source of the problem originated. These hazards can be found in the form of lead paint on different surfaces, disease vectors found on rodents on-site, mold growing in a basement or on the bathroom walls and different chemicals used for repairs such as paint (Wu et al, 2007). There have been reported health effects that have correlation between the level of environmental problems and how severe the health symptoms seem to be. However this information also comes with the fact that most college students are unaware of their health and safety issues. They are provided with little to no information about keeping a safe home and its requirements (Johnson, 2009). A study done in 2002 showed that there was an increasing amount of evidence for the correlation between chronic illnesses, injuries and poor nutrition with the quality of the person's living environment. These studies were able to show that there is an established connection

between having a damp mold filled environment in your home and continuously having headaches, fevers, sore throats and even vomiting (Krieger and Higgins, 2002). With studies like the one conducted by Krieger and Higgins, it gives more cause for further concern and action on the matter. This problem however is not one that is only seen in impoverished areas or low rent student housing.

Being exposed to different toxins in a home has grown to be a national issue. Multiple states have begun to pass legislation to create strict guidelines that generate a cleaner and healthier atmosphere in each home. California, for example, passed the Toxic Mold Protection Act of 2001, which enforces standards on the different levels of mold exposure and the removal of mold when a building is being used during real estate transactions (Krieger and Higgins, 2002). If mold can be removed from a building before a tenant moves in, then it creates not only a healthier living space but in the long run allows the landlord to deal with less toxin-induced problems. This however would involve the tenant being aware of the issues and having the house tested for indoor health irritants. In older college towns, such as Meadville, chances are very high that almost all of the students living in a home located off campus are living in an older low rent home that is in need of a serious fix up or is currently in the process of being fixed. A junior or a senior is not focused on getting rid of the lead paint on their window-sill or the mold that is growing on the bathroom ceiling since they are generally more concerned about school and social interactions. The fact is however, that many of the college students probably do not realize that it is even there. There are several towns and cities that have groups that can come in and test the house for lead, mold and other indoor air pollutants. Meadville, PA for example, has a group run out of Allegheny College that tests homes for free. If students took advantage of these free services, then they could obtain the information needed to clean up their homes.

1.2 Scientific Research on Mold and Health

Studies done on the correlation between having a mold contaminated home and the health effects of the residents has shown strong significant evidence. In a study done by Linda Johnson

et al (2009), 181 homes were inspected and tested for asthma triggers. After reviewing the homes that showed poor results on the health examinations and health/home assessments it was concluded that each should have low cost intervention techniques implemented. When found, any contamination was removed and followed by asthma education to the residents of the home. Six months after the initial examinations, a follow up was conducted and found that breathing problems were significantly improved when dehumidifiers, HEPA filters, and room air cleaners were used or installed. The total mold spore counts were reduced one order of magnitude in 25% of these homes. The overall indoor and outdoor spore levels also decreased. These low cost implementations not only cleaned the indoor air quality but also improved the health in asthmatic children that lived in those homes (Johnson et al., 2009). Statistics also show that nearly 20 million people in the United States have been diagnosed with asthma which is worsened by exposure to mold. Asthma leads to nearly two million emergency room visits and 5,000 deaths per year (HHHC, 2009). In a study done on the medical effects of mold exposure it states that about five percent of the population are predicted to have, at some point in their lives, allergic symptoms as a consequence of exposure to fungal allergens (Bush et al, 2006) (American College of Environmental and Occupational Medicine, 2002).

Literature reviews also suggest that children who live in a home with a damp environment, visible mold growth or both are more likely to experience lower respiratory problems such as coughing and wheezing as opposed to children who do not (Bush et al, 2006) (Peat, Dickerson and Li, 1998). This information supports the idea that living in a home that is affected by mold in most circumstances will influence the current resident's health issues. However studies suggest that skin and other sensitization is more common from pollens, animal dander and dust mites than with mold (Bush et al, 2006). In an article on improving indoor environmental qualities, it was written that one of the biggest barriers is the lack of information and education on mold, as well as money issues. In the United States, 13% of the nation's lowest income bracketed families spend more than 50% of their income on their housing and two million households live in severely inadequate housing (Wu et al, 2007).

1.3 College Students and Mold

College students live a very hectic lifestyle and most do not get the amount of rest that they need. However being in their early twenties, a student should be able to have high amounts

of energy throughout the day and into the evening hours. When a student begins to realize that they are being affected by their living situation, there is probably more than one solution to the problem. Generally lack of sleep does in most cases have a high effect on a student, but that should not severely affect the respiratory system or cause a constant sore throat or headache. However if educated enough, a student would know that there are correlations between people with respiratory symptoms and homes with high levels of mold (Dales et al, 1991).

In China, a cross sectional study was carried out on a college campus to compare the dampness in dorms and its effect on allergy and airway infections in its students. They found that there was a significant positive association between the health problems and the atmosphere the students were living in (Sun, 2009). There are many places in the world where weather has destroyed or severely affected a living environment and the residents who are temporarily unable to inhabit the space. When the 1997-1998 El Nino storms occurred, there was a significant amount of rain that pounded Southern California. Researchers were given the chance to go in and look at rooms that were both flooded and not, and they found that although the mold had grown in the damp rooms, there was a significant amount of mold in the walls of the non-water damaged rooms as well. These additional mold spores were affecting the air, coming in through the different vents and therefore affecting the health of the residents in the building (Morey et al, 2003). In addition there can also be a significant amount of bacteria or mold that is growing within the walls, or even places like an indoor plant, that will affect the everyday lifestyle of a college student without their knowledge.

As previously stated, the homes that college students currently inhabit in the city of Meadville, Pennsylvania are generally not the nicest of homes. Most are poorly taken care of by the residents or the homeowners and most are rarely cleaned properly or dusted. With the amount of people that are usually sick, it seems safe to say that there could in fact be another cause contributing to some of the illnesses going around the campus.

When I first began this project, I wanted to look at the mold growth in off campus housing. I contacted a few of my friends and athletic teammates for approval to use their homes as random test locations. I then started by testing the houses for mold and researching the different kinds of mold tests and mold problems that existed. I used ten off campus houses with each test taking an hour on average. The selection process was random and there was no specific type of house that I was looking to test. The only requirement for testing was for the house to be

student rented and off campus within the city of Meadville, Pa. An hour before each test, a Petri dish from one of the test kits I bought was filled with a mold medium liquid created by the Pro-Lab company and left to harden. Once hardened then the dish was set out to test and was placed out in a common living space for an hour. While sitting out, it was exposed to the air and attracted any mold spores that existed. Once the test had been out long enough to collect any spores from the area, the Petri dish was collected and left to incubate for 48-60 hours. Then each one was visually inspected for mold.

While evaluating each Petri dish, I noticed each had multiple types of mold. For identification, I looked up the different kinds of mold that are present in houses and used pictures to identify the different mold spores in the Petri dish. Once I had the results, I shared the results of each one with the different households. Each home was told that if they wanted further information or ways to get rid of the mold, I would give them all of the information once my project was completed. While discussing this with the students I realized that the original path of my project was not feasible and the best way to get the information out to other people was to create a pamphlet or guidebook explaining everything that a college student would need to know about mold.

Having the different Petri dishes examined for the exact types of mold in each home would give me information that I wanted, but wouldn't necessarily be able to be used effectively for resolution. However being able to educate people on mold and put the power in their own hands, seemed to be the better, more efficient way to get the word and information out faster.

The first part of the research process, collecting mold data in ten different houses off campus, turned out to be a larger success than anticipated. There was some concern at first when there was little to no mold growing on the Petri dishes, however when left to incubate for a longer period of time, the mold spores grew in massive quantities. There are multiple kinds of mold that can be found in any living space. Mold spores, although not always visible to the human eye, are constantly in the air and when there is no place for the mold to settle and grow or live, the spores just remain in the air (Toxic Mold Health Effects, 2009). These ten different houses each house had a Petri dish placed in the room of which the residents spent the majority of their time throughout the day. While looking at each house a person would assume that their home is mold free because there is none visible, however as stated earlier there is mold that is in the air and out of sight.

In the houses tested, there were four different mold types that were found. The first found in all the Petri dishes was white mold. This is a common mold that can grow and be found in any household that has a damp area to sustain it. White mold is also a type of mildew and is widespread (White Mold, 2009). There was also a yellow mold found in a few of the Petri dishes, this mold is harmful to plants however there is no evidence so far suggesting that this type of mold is harmful to humans. Yellow mold lives in windless, shady and damp environments (Toxic Yellow Mold, 2009). The third mold found was Green Mold and it was found on almost all of the tests and can be potentially toxic to those living in the environment. It is one of the more common forms of mold and is usually commonly found growing on rotting fruit in ones kitchen. The final kind of mold that was found in the Petri dish and potentially the most damaging was black mold. Black mold is thought to be one of the worst types of mold that someone can have in their home as this mold can compromise your immune system and cause long term affects (Black Mold Removal, 2009).

These different types of mold were not only found on the test, but after further review and research of each of the homes, were also found in the bathrooms and on other surfaces. The first house that was tested proved to be one of the worst, as there was black mold growing all over the inside of toilet seat and shower curtains. The residents of the house never cleaned the damp surfaces which allowed the mold to attach itself, feed and begin growth. In another house tested, the tenant's landlord ripped up a carpet after a pipe busted in the house and didn't allow the floor to dry properly before re-installing the carpet. However at a later time when the rug was removed and lifted, the floor which was not left to dry for a long enough period of time had developed a large amount of mold from under the carpet, including some of the black mold mentioned earlier. The room also held a pungent smell which can be one of the tell tale signs of having mold even if you can't see it.

This information can be overwhelming for a student or even an adult who knows nothing about what is in their home or what mold can actually do if left for a long period of time. The following sections are in reference to a guidebook, designed for students to easily understand what mold is, how to avoid it, and if you have to, how to get rid of it. I decided to use a guidebook because it is easily navigated, and there can be a lot of information provided in such a small space. It is also easier to understand than say a book or a long-winded senior thesis on how to get rid of mold in your home.

My target audience for this guidebook would be any college student, however it's probably more relevant to those that are living off campus in a house or an apartment. I want it to be used as a tool or reference guide since I know that college students receive a lot of information in pamphlets and just stick them on the fridge without reading them or just forgetting about them. My hope is that people will look through it and create an awareness of the problems that could currently be going on within their homes, and use the education presented to clean and protect their homes.

-Guidebook-

Everything You Wanted to Know About Mold but Were Afraid to Ask

Mold and Health

There have been a large number of studies done on how mold affects both families and college students. These studies have shown that there can be severe effects on a person living with mold but as always mold, like most things, affects everyone differently. A high dose of mold can affect even the healthiest person.

When mold reproduces with spores and when the spores become airborne they will often occupy the space for a long amount of time. If inhaled, the spores can cause a wide range of reactions. Some of these reactions are: Itchy Eyes, Runny Nose, Sore Throat, Asthma/ Breathing problems, Diarrhea and Skin rashes.

Asthma affects many people and mold is an allergy trigger within the household. The mold-allergy connection is seen to be one of the worst and one of the biggest concerns within a household. There are also studies that show that mold could be the cause of asthma. In college students it has also been seen to affect the amount of sleep that someone is able to get and their energy levels throughout the day.

Mold may not have any visible effects on your health or any effects at all. However in most households there is at least one person that mold affects.



Figure One:
NHS West Essex

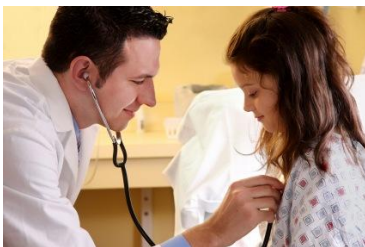


Figure Two:
Planet Mold

If you are always tired or constantly have any of the symptoms stated above, you could be exposed to mold. The easiest thing to do is test your home and see if it is mold that is creating problems. After testing you will know and you will soon be able to clean and hopefully rid your house of the mold and the symptoms that come along with it.

Why does it matter? Left untreated mold can have severe effects on your body and keep you from participating in your everyday activities.

Determining If You Have Mold

This could be the most important question to ask when looking to clean out your home and unfortunately for most the answer is yes. This does not mean however that you have a mold problem in your house, or that there is even mold growing but it does mean that there are microscopic mold spores floating around in the air unattached and unable to feed on the

surroundings. If given the place or time to grow, that is when you start to find mold growth and potential problems.

Mold is a microscopic fungus that travels through the air as tiny spores. In the wild, mold uses enzymes to break down dead plants and animals to feed. However, mold can also grow in indoor structures, as all it needs is a moist environment and a food source for the spores to multiply and create a permanent residence. In order for the mold to survive it needs a damp and somewhat humid environment. From the smallest leak in the ceiling to a pipe burst in a house, a mold issue can come about.

If you look for mold in your home and do not see any or have a musty smell in your home but no visible mold, then there are still ways to test your home. Bringing in a professional can become pricey, so there are alternative options. Go to your local Home Depot or home improvement store, and purchase a Mold: Do It Yourself Test Kit. This is an inexpensive kit that allows you to receive an answer on whether or not you have mold. The kit comes with three different pieces and gives you the option to test your home in three different ways. You can test the air coming through vents in your home, open areas of your home or simply using the sterile swab to collect a sample and send it in to be tested. The test comes with a Petri dish, mold medium and sterile swab. The test is done in three easy steps.

First the mold medium is poured into the provided Petri dish. Swirl it around to make sure that the whole bottom of the Petri dish is covered in the mold medium. The mold medium is used to capture mold spores in the air, cultivate it and allow it to grow in the Petri dish. Leave the dish for an hour with the top on to allow the medium to harden.

After an hour, place your Petri dish out in an area you would like to test. This could be in your common room in the house or in an area you suspect has mold. Leave the Petri dish out with the top off for about an hour.

After the dish has been left out for at least an hour, put the top back on and leave it be for at least 48 hours. In my own personal experience it took about 24 hours longer than that for the mold to grow. After this period of time your Petri dish will give you a visual of the different kinds of



*Figure Two:
Mold on Toilet in House*



*Figure Three:
Mold On Toilet*



*Figure Four:
Clean Air and Sciences
Mold in Basement*



Mold Test – House #1



Mold Test- House #2

mold that are in your home. Below are pictures of different house samples I took during my study.

If you would like to find out more information about your test, you can send the Petri dish in to the Pro-Lab and they will diagnose your mold for about thirty dollars.

Eliminating Mold

Got Mold?
Now you just
have to get rid
of it.



Figure Five: Mold Masters

Mold problems can be put into two categories, small concentration and large concentration.

A small concentration of mold would be considered under the lid of your toilet seat, on a sink in your home or in the shower. This type of mold is easily cleaned and removed. A large concentration would be a large portion of a basement wall or mold living underneath a carpet. These are harder to get rid of and 9 times out of 10 take an expert to help remove.

Most instances of having mold in your home take simple elbow grease and some soap and water. It is that simple, fill up a bucket with hot water and add some of your favorite dish soap. Grab a good sturdy brush, put on some gloves and have at it. Contaminated material should be thrown away in a closed bag and removed from the house. Wash the area with a diluted bleach solution and then allow the area to sit and disinfect. After about 15- 20 minutes, rinse off with water and allow to dry.

Materials that are porous, exposed to the area and are able to house spores such as wood, carpets and fiberboard should be removed and discarded. This will keep the mold from re-growing or spreading in the home. If kept, there is a very high chance that the mold will re-grow and restart the process.



Mold Test- House #3



Mold Test- House #4

If you have a damp or wet rug or carpet you cannot remove, sprinkle baking soda on the rug and let it sit for several hours. Vacuum the powder up after it has soaked in and continue until the problem goes away.

If the area containing the mold is large and cannot be easily removed, then a professional should be called in to clean and disinfect. This may mean the mold needs to be power washed or the surface needs to be permanently removed.

When cleaning always protect yourself from the mold by using rubber gloves. Avoid contact with skin and eyes, especially if you have allergies

Preventing Mold Growth

It is much easier to take precautions and keep your home from growing mold than it is to clean and take care of a problem. To prevent mold growth in your home there are a few simple things that can be done.

Keep an eye out. Mold happens, and for most it starts out very small. If you catch a small amount in your bathroom or in your kitchen clean it and get rid of it before it has time to spread. This takes just a few minutes out of your day with a little soap and water. If you clean it, the problem will hopefully go away.

Stop leaks before they start. Leaking water is a breeding ground for mold. If there is a place in your home that has a leak or tends to gather water, get it fixed. Fixing the leak now will save you from mold removal in the future. If you have places that have exposure to water, try to keep it dry. This is as simple as checking the spot every two weeks and drying the area down if it seems damp. This will stop spores from landing and growing into a problem. If you cannot figure out where the problem is, just keep an eye on the area. Spraying vinegar is one way to control mold growth. Spraying drying racks, cutting boards, behind sinks and under toilet seats kills the spores and stops mold growth.

Control the temperature in your home. If it is extremely humid or moist in your house, you are creating the perfect breeding ground. Use a dehumidifier to take the moisture out of the air. Set the humidity around 50% because mold cannot grow below this point.

When it is hot and humid in your home, use an air conditioner, if possible, to balance the house out.

Be smart. If you take the necessary precautions and clean your home, mold should not be an issue. Freak accidents like bursting pipes happen, however in normal households mold can be controlled and eliminated. Use your best judgment when it comes to dealing with mold, if it does not look like it should be there- chances are you're right.



Contact for Further Information:

Basic Information:

Environmental Protection Agency – Mold Resources

<http://www.epa.gov/mold/moldresources.html>

Centers for Disease Control and Prevention- Basic Information

<http://www.cdc.gov/mold/faqs.htm>

Pennsylvania Department of Health- Mold Management Task Force

http://www.portal.state.pa.us/portal/server.pt/community/asthma/14228/pennsylvania_mold_management_task_force_report/557608

Health Related:

Asthma and Allergy Foundation of America- Mold Allergy

<http://www.aafa.org/display.cfm?id=9&sub=16&cont=58>

The Allergy Relief Center- Mold Allergy Prevention and Control

http://www.theallergyreliefcenter.com/mold_allergy.htm

WebMD- Mold Allergy

<http://www.webmd.com/allergies/guide/mold-allergy>

Mold Cleanup:

Environmental Protection Agency – Mold Cleanup

<http://www.epa.gov/mold/cleanupguidelines.html>

Centers for Disease Control and Prevention- Cleanup and Remediation

<http://www.cdc.gov/mold/cleanup.htm>

Washington State Department of Health- FAQ

http://www.doh.wa.gov/ehp/ts/IAQ/GOT_Mold.html

Free Home Testing:

Healthy Homes, Healthy Children- Home Visit Request

<http://www.allegheeny.edu/forms/form.php?id=707>

Concluding Thoughts and Future Work

3.1 Problem Overview

Mold has been a problem in households all over the country for years. From off campus houses to dorm rooms on our own campus, there has been a need to rid and protect our living space from the danger of mold. Generally when a person thinks of mold, they think of the mold growing on their food in the cupboard or in the refrigerator. However having a damp area in your basement or bathroom is also giving an inviting place to stay with a good food source. Generally these mold problems can be cleaned up and removed relatively easily, however if left alone long enough, you could have a serious predicament. Mold may seem harmless but when found in large amounts it can be lethal. A good example of this would be a damp basement where mold has been growing. If the basement is left alone and the mold is given the time and space to grow, the affected walls could have to be removed because of the amount of damage. The health risks associated with mold also increase as the infected area increases. What once may have made you simply sneeze, could give you an upper respiratory infection or rashes all over your body. So at what point is it enough? Can the smallest bit of mold be taken very seriously?

With all the research and information given, mold should be taken seriously at every point; however it is likely that it will only affect you in higher doses. A small patch of mold under your toilet seat is not likely to cause you any harm and most likely that patch around the shower head in your bathroom will not cause any trouble either. It is however still something that should be taken care of. The cleaning supplies can be easily accessed in your home, or picked up at the store and it only takes a few minutes of scrubbing to get rid of. Another thing to keep in mind is that there are places where the mold is going to re-grow. This may be discouraging because you spent the time and energy to get rid of what was there. Think of it this way though; if you take the time to clean and keep an eye on the area then the maintenance to keep it clean will be minimal. Leaving it however can create a bigger hassle and in the end make it harder for you to clean it up. There are three pieces of advice I would give someone on keeping mold out of your home. The first is being smart. There are many things that you cannot control, however you can control how much mold you allow to grow in your home. The second is to be proactive.

If you have parts of your home that are more susceptible to leaks or becoming damp, have them fixed. You can also search the Internet for simple ways to fix the leak yourself. This simple, cheap fix could save you money down the road. Finally, my last piece of advice would be to educate yourself. The more you know about the different dangers that could occur in your home, the easier it will be for you to identify and fix the problem.

This project came to me one night after my first proposal had been turned down. I walked into our bathroom and looked up, there was mold around the shower and when I walked in farther I realized there was mold under the toilet and sink as well. It struck me that in my four years here, although I had worked with Healthy Homes to rid community member's houses of mold, I had never been told how to rid my own home of mold or even how to check. Living in older homes here in Meadville there are multiple problems, however we choose to ignore them and live with them until we move out. I realized though that mold is something you do not have to live with, and taking the proper steps to prevent mold could make living in your home more pleasant. So I decided it was time for college students to have the option of learning about this problem and prevent it from causing any damage. Using the guidebook will allow college students to become educated on the dangers and prevention of mold and give them the option of protecting themselves. It is unrealistic to think that every person who reads this or is given the information will do something with it, however my hope is that it helps even one person because that is one more person who can protect themselves from mold.

3.2 Expectations and Future Work

There is so much that I would have liked to have accomplished but because of time and resources I was unable to do so. I think the very tip of the iceberg was touched when it comes to the mold issues both on and off campus. It was hard trying to test houses for mold when I did not have the best resources available. It would have been great to be able to send all the tests into the lab and find out the specifics on the mold that was growing or find the source of the mold problem in each house that I tested. I think that this research could be the building block or jump off point for someone else who would like to better understand the mold problem in our area. There have been mold issues all across campus, as multiple dorm buildings have had mold growth in both bedrooms and bathrooms. However I was not focusing on that area so I did not

have time to test or research the problem occurring there. From my work in the off campus houses however, I can say that it does not surprise me that there would be mold issues in the dorm buildings. With the amount of rain and snow that we receive in this town, one crack or poorly insulated corner could lead to mold growth.

There are a large number of studies that can be started from the project I completed this year and if I was to come back for another senior year to do another comp the following study is what I believe I would do. It is very important to me to acknowledge the fact that off campus housing is not the only point of mold problems and that with the proper testing the mold problems on campus could also be addressed. I would look at testing all of the dorm buildings, including the newest ones that have been opened on campus. I would also select a group of off campus houses, probably different ones than were tested the first time. After testing and collecting all of the information, it would be nice to have all of the results sent in to the lab and have them tested to see what the specific molds are that are growing all over on and off campus. This is not cheap, as I experienced this year, so applying to different places to help get funds would be the best bet. I would also try to see if the school would cooperate and work with me on finding the problem and starting to fix the different causes of the mold. It would be a stretch to believe that the school would want to know all about the mold problems on campus. Knowing about the mold would mean spending the money to fix and remove it. However my hope would be that the evidence would be strong enough to support the cause. It would be great to have the result of this new comp to be the school getting the ball rolling on either a mold prevention or awareness for students living both on and off campus. It would not be hard to get a program started; the struggle would be the cost of both removing the mold that was found in the residence halls and fixing the origin of the problem. It would be a definite challenge, however if it could be achieved it would be extremely worthwhile for all of the parties involved. There are so many other projects that could be started with this information; however I feel that this would be the best way to use it and move forward.

In the end it was a lot harder to find out about mold and cleaning your home than I would have ever guessed. All the information is available; it just depends on how hard you are willing to look for it. My hope now is that by making this guidebook available, students will have easy access to information about mold and will have cheap and easy alternatives to clean their houses. It also will allow the students to find out the information on their own and not have to go through

a landlord or the school to fix the problem; they can just use the knowledge to fix it themselves. By the time I graduate I would like for the Guidebook to be located in Res Life, the Health Center, the Healthy Homes website and even the Greek Life housing located on campus. The guidebook will also be up online in pdf form for people to read. Having the guidebook out as soon as possible will allow me to promote my work before I leave campus and am unable to explain and hand it out to others.

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