***Timestamp For The Amoxicide, The Story of Cillin the Villain.***

**00:00-00:03:**The Amoxicide, The Story of Cillin the Villain.

**00:04-00:09:**This video is brought to you by Ben, Brittany, Luis, Maya.

**00:10-00:19**:The Amoxicide, The Story of Cillin the Villain is marked with CCO1 Universal.

**00:20-00:23:** Emily Ellis is a 5 year old girl who is in kindergarten (da Fonseca, 2000).

**00:24-00:25:** She was lonely and turned to candy to cope.

**00:26-00:31**: She also has a heart condition and is at risk for endocarditis (da Fonseca, 2000).

**00:32-00:39:** Endocarditis is a life threatening infection to the heart and needs to be treated with antibiotics if a procedure or condition is deemed risky (Mayo Clinic, 2023).

**00:40-00:45**: While at school, Emily devoured tons of candy daily and in every class.

**00:46-00:50:** But this all came to a halt when her back molar started to radiate with pain.

**00:51-00:53**:She also noticed that she has lesions in her mouth.

**00:54-01:02**: Her parents took her to the dentist and lo and behold, Emily had developed multiple cavities in her molars and caries lesions in her mouth (da Fonseca, 2000).

**01:03-01:10**: The dentist and the cardiologist collaborated together and determined that they needed to heal the lesions before fixing her affected teeth (da Fonseca, 2000).

**01:11-01:16:** Emily was given ampicillin, a common antibiotic to treat the lesions intravenously to prevent possible endocarditis (National Library of Medicine, n.d.).

**01:17-01:25:** Then in six months, she would undergo 2 procedures 3 weeks apart with no sign of any side effects and the lesion looking better(da Fonseca, 2000).

**01:26-01:30:** Emily went in for the first procedure six months later.

**01:31-01:33:** An hour before the procedure, she was instructed to take amoxicillin PO.

She showed no side effects to the antibiotic once again (da Fonseca, 2000).

**01:34-01:37:** She then went in for her procedure.

**01:38-01:40:** The procedure went well, and to ensure that Emily was protected from infection, the doctor prescribed amoxicillin again, as it seemed to work and cause no harm (da Fonseca, 2000).

**01:49-01:50:** 3 weeks have gone by.

**01:51:** It was now time to have her second procedure.

**01:52-01:54:** Once again, the doctor gave Emily another amoxicillin pill, knowing it had been effective in the past (da Fonseca, 2000).

**01:55-02:00:** But something more sinister was at play, something waiting in the shadows, praying and waiting for Emily to fall into its trap.

**02:01-02:10:** Emily sat in the waiting room, anxiously listening for her name to be called.

**02:11-02:16**: She noticed her foot started to itch (Weisser and Ben-Shoshan, 2016).

**02:17-02:18:** She didn't mind this, but something small was up to no good.

**02:20-02:22:** You see, Amoxicillin had a deep grudge against Emily.

**02:23-02:26:** So much so that it became Cillin the villain, a scary serial killer, Antigen.

**02:27-02:33:** The fact that Emily didn't immediately have a reaction really angered Cillin the villain to the core, and he swore that the next time that he had a chance to get Emily, he would get Emily for good.

**02:34-02:47:** One to 10% of children that need to take amoxicillin are hunted down by Sillin and given a life-threatening reaction (Wong et al., 2020).

**02:48-02:55:** He is a feared enemy within the T&B cell communities.

**02:56- 03:00:** After about 1/2 an hour of Emily's itchy foot, it turned into something much worse.

**03:01-03:04:** Her lips and tongue swelled up like balloons and she started to develop a body wide rash (Weisser and Ben-Shoshan, 2016).

**03:05-03:09:** She also couldn't swallow because her mouth was so swollen (Abrams and Khan, 2018).

**03:10-03:12:** She has a deadly drug allergy (Abrams and Khan, 2018).

**03:13-03:17:** Before we proceed with the terrible situation that has fallen upon Emily, let's take a closer look at Cillin and the Villain.

**03:18-03:25:** Cillin and the Villain can be found in its serial killer form.

**03:26-03:29:** B Lactam, B Lactam is in antibiotic drugs such as penicillin and amoxicillin (Wong et al., 2020).

**03:30-03:35:** It's usually used for good purposes like sinusitis and infection prophylaxis in a case such as Emily's (National Library of Medicine, n.d.).

**03:36-03:43:** The Ige and T cells in Emily's body and other individuals have mediated mechanisms that suggest that certain antibiotics bind non covalently to antigen interacting structures like T cell receptors of MHC and cause direct stimulation of the immune response (Schnyder and Pichler, 2009).

**03:44-04:03:** This is what Cillin the villain intends to do to Emily.

**04:04-04:07:** The side effects to Cillin's attacks happen within 30 to 60 minutes and show up in the form of hives (Abbas, Moussa, & Akel, 2023).

**04:08-04:13:** And angioedema, swelling in the tongue, lips, face and airways, hypotension, and even sometimes anaphylaxis (Abrams and Khan, 2018).

**04:14-04:25:** When Cillin was first brought into Emily's body through her IV ampicillin 6 months ago, he transformed into his villain form, the beta lactam compound, entering her bloodstream.

**04:26-04:37:** Emily's antigen presenting cells noticed that Cillin was in the blood and engulfed, processed and presented this to her T helper cells at the Sheriff's Office (Schnyder and Pichler, 2009).

**04:38-04:48:** The T helper cells took in Cillin's information and created an adaptive response and got her B cells to come in for backup (Abbas, Moussa, & Akel, 2023).

**04:49-05:02:** The B cells shoot off IgE antibodies that are specificlly made to fend off Cillin (Abbas, Moussa, & Akel, 2023).

**05:03-05:04:** Cillin at this time is seemingly losing the battle and looks like he's been killed off, but he has left his mark and has done exactly what he wanted to do and magically disappears (Broyles et al., 2020).

**05:05-05:16:** When it looks like Cillin is all gone, some of the IGE antibodies either bind to mast cells and basophils or remain free-floating in Emily's body (Broyles et al., 2020).

**05:17-05:25:**These IGE antibodies have also taken in Cillin's information and kept it in their records (Broyles et al., 2020).

**05:26-05:30:** So they are ready to make a reaction if he is brought back into Emily's blood (Broyles et al., 2020).

**05:31-05:36:** But this is just what Cillin the villain wanted to do.

**05:37-05:39:**This period of time is called the sensitization period (Abbas, Moussa, & Akel, 2023).

**05:40-05:42:** It's the first step into Cillin's master plan.

**05:43-05:48:** The second time Cillen made a break into Emily's body was during her first dental appointment when she had to take a pill of amoxicillin (da Fonseca, 2000).

**05:49-05:57:** Again, Cillin, the villain's antigen form, beta-lactam, enters her body.

**05:58-06:02:** Beta-lactam is engulfed by her detective antigen presenting cells and brought in again to the T cells at the Sheriff's Office (Wong et al., 2020).

**06:03-06:11:** T cells recognize this evil antigen from months ago and get the SWAT team of B cells to fire off IgE antibodies once again to try and catch Cillin (Schnyder and Pichler, 2009).

**06:12-06:22:**But it's been a while since Cillin has struck Emily's body, so Emily's body isn't quite ready to kill Cillin (da Fonseca, 2000).

**06:23-06:28** :And again, Cillin magically disappears, but the antibodies are now re-sensitized and are ready to strike and kill if Cillin decides to break back in, hanging out on the mast cells, basophils, and floating around in Emily's body (Abbas, Moussa, & Akel, 2023).

**06:29-06:45** :The 3rd and final time Cillin breaks into Emily's body is during the second dental appointment when she takes the amoxicillin pill again (da Fonseca, 2000).

**06:46-06:54** :This time the mast cells and basophils are ready and have pre-existing IgE antibodies (Schnyder and Pichler, 2009).

**06:55-07:00** :So when the antigen presenting cells take in Cillin, the villain's beta lactam antigen, the T cells at the sheriff's office go for the kill (Schnyder and Pichler, 2009).

**07:01-07:07** :This time they get the SWAT team of B cells to create more antibodies (Schnyder and Pichler, 2009).

**07:08-07:13** :But at the same time, the other free-floating antibodies are connecting to sillin's receptor site, which activates an immediate cellular response for B cells to produce even more antibodies (Schnyder and Pichler, 2009)(Warrington, Silviu-Dan, & Wong, 2018).

**07:14-07:25** :Cillin's antigens bind to the IgE antibodies that are on the mast cells and basophils, but this attracts other nearby receptor sites to move closer to Cillin's antigen, which causes the mast cells to finally burst and release histamine, cytokines and prostaglandins (Schnyder and Pichler, 2009).

**07:26-07:42** :But all of the extra firepower causes Emily's blood vessels to dilate and permeate, which then causes fluid and plasma proteins to exit her circulatory system, looking for Cillin the villain (American College of Allergy, Asthma & Immunology. n.d.)(Warrington, Silviu-Dan, & Wong, 2018).

**07:43-07:56** :This was Cillin's plan all along.

**07:57-07:58** :The dilation and permeation of Emily's blood vessels are now causing his grand attack plan (American College of Allergy, Asthma & Immunology. n.d.).

**07:59-08:04** :First it starts as a foot itch, but within 30 minutes her body is starting to go into a full on rash (Weisser and Ben-Shoshan, 2016).

**08:05-08:10** :Her throat, lips and tongue are swelling up, which causes her to start breathing fast at a rest rate of 34 (Weisser and Ben-Shoshan, 2016)(HealthLinkBC, n.d.) (da Fonseca, 2000).

**08:11-08:18** :If something doesn't happen quickly, she's going to be at risk for a serious respiratory incident (Abrams and Khan, 2018).

**08:19-08:23** :Cillen the villain was ready to take another victim.

**08:24-08:26** :He had taken over her cell's control and was killing at this very second.

**08:27-08:30** :It looked hopeless until a nurse came running over to Emily, noticing she was having a reaction.

**08:31-08:36** :The medical team on standby immediately gave Emily 25 milligrams of diphenhydramine hydrochloride, which reduced her swelling in her airways and face and also took away the rash (da Fonseca, 2000)(BC Centre for Disease Control, n.d)(Abrams and Khan, 2018).

**08:37-08:48** :Cillin the villain, was being washed away and now he was the one being attacked.

**08:49-08:53** :Emily's symptoms were fading and so was Cillin.

**08:54-08:57** :In Emily's case, it's important the medical team monitors her blood pressure, Airways, and gives appropriate medications to decrease her heart rate as she recovers from this tough battle (HealthLinkBC, n.d.)(Abrams and Khan, 2018).

**08:58-09:08** :The doctors then were able to tell that amoxicillin and Cillin the villain was the culprit through intradermal testing of her IgE levels (Weisser and Ben-Shoshan, 2016).

**09:09-09:18** :The day was saved.

**09:19** :Cillin had been revealed to be the attacker in Emily's body.

**09:20-09:22** :And now he will never be able to hurt her again as he was placed in her allergy list jail.

**09:23-09:29** :Emily is instructed to stay away from amoxicillin and ampicillin and will be given an alternative penicillin in the future (da Fonseca, 2000).

**09:30-09:37** :All ends well and Emily can say good riddance to Cillin the villain.

**09:38-09:42** :We hope this tale is cautionary and everyone is aware of Cillin the villain, the serial killer.

**09:43-09:47** :Next week we will cover the tales of Sulfixia the Sulfa Stabber.

**09:47-09:51** :Thank you for listening to the Killers of Modern Medicine podcast.