

***Measles, Sneezles, and Things that Go Mumps in the Night***  
**(aka “The Measles Safari”)**  
**COURSE SYLLABUS**

**COURSE DESCRIPTION AND RELEVANCE**

The course focuses on an important family of viruses known as the **paramyxoviruses**. Important members of this family include measles, mumps, and a number of respiratory viruses including respiratory syncytial virus and parainfluenza virus that cause pneumonia and croup. This explains the somewhat whimsical name for the course. The course will also be referred to as “The Measles Safari”, derived from the most famous member of the family and from a series of classes taught using a similar intensive format.

The purpose of this class is give a group of rising sophomores an insiders' look into the paramyxoviruses. Significantly, the paramyxoviruses will serve as a lens allowing us to look at general aspects of infectious disease. However we will also focus upon a number of quirks of this particular group of viruses such as atypical vaccines and slow infections. We will take a broad view of the paramyxoviruses, covering their history, biology, taxonomy, evolution, epidemiology, clinical presentation, immune response, treatment, vaccination and prevention, public health implications, emergence of novel paramyxoviruses, aspects of eradication (measles and rinderpest), along with the many policy issues surrounding the paramyxovirus family, including issues of scientific integrity, access to health care, and the role of media especially with regard to measles vaccination. The course will also provide the opportunity to interact with some of the important people in this field hearing about their areas of expertise and well as their career paths. This class will cover a fair bit of biology but no prerequisites or prior knowledge of biological processes is required. The instructor believes that rational policy design is critically dependent on a detailed understanding of the underlying biology.

**FORMAT**

The class will meet on a daily basis for three weeks in September, using an immersive format. Class sessions will consist of lectures by the instructor, SCA presentations, guest speakers, student presentations, class activities, debates and simulations, discussions based on readings and in-class presentations, and field trips.

## **PREREQUISITES**

The prerequisites for the course are 1) an interest in the topic and 2) a willingness to cover and learn the biological underpinnings in this area of study. There are no prior course prerequisites.

## **TEACHING PHILOSOPHY**

The course is intended to be interesting, educational, useful, and fun. This will work best if each student contributes to the structure of the course and tries to function as a self-motivated scholar. It is hoped that each student will surprise themselves with what they are able to accomplish. It is also hoped that the students in the class will form a community of scholars and friends that will persist through their college career and beyond.

## **GRADING PHILOSOPHY**

The course will be graded on a pass/no credit basis. Students are expected to be self-motivated and produce high quality work with emphasis on academic scholarship. A great deal of credit will be given to those students who show independent initiative.

## **COURSE REQUIREMENTS**

### **Student Requirements**

- 1) Mandatory class attendance and participation
- 2) Three PowerPoint presentations
- 3) Presentation write-ups
- 4) Course blog / new and hot (3 per week = 9)
- 5) Online book reviews – 2 book reviews
- 6) Observations / Twitter – (3-5 per day x 17 days)
- 7) Speaker introductions
- 8) Wikipedia entry
- 9) Viral model
- 10) Concept map
- 11) Timeline – 10 data points
- 12) “Final exam”
- 13) Dossier

## **COURSE SCHEDULE**

The course schedule will be posted on the gmail account [measlessafari@gmail.com](mailto:measlessafari@gmail.com). It represents our best understanding of the content and timing of the seminar events. Given the number of different components of the seminar, things may change even after the seminar has begun. These will be posted in real time and announcement will be made by email or in class. Students are expected to be **flexible** in embracing these schedule changes.

## **COURSE CONTENT**

The **course topics** will generally progress from basic biology to issues of policy, with the emphasis on the use of biology to inform policy. The content will also move from the historical to current issues and research.

## **COURSE TOPICS**

A list of course topics is provided as a separate handout. This will be used as a guide to the order of course material and as a list of student assignment topics. Please let me know of any additional topics that you wish to have covered.

## **COURSE DIRECTOR**

**Robert Siegel**  
(650) 678-8728

[siegelr@stanford.edu](mailto:siegelr@stanford.edu)

Dr. Siegel is an Associate Professor at Stanford Medical School, where he is Course Director of the Infectious Disease component of the required preclinical curriculum. Robert has appointments in the Department of Microbiology and Immunology, The Program in Human Biology, and the Center for African Studies. His courses focus on virology and infectious disease, on genetics and molecular biology, on global health and development, on photography, and on Darwin. Dr. Siegel has won numerous teaching awards including the Walter Gores Award, The Henry Kaiser Award, and the ASSU Teaching Award. He has served in an advisory capacity for numerous international NGOs, organizations, and projects including Wonderfest, FACE AIDS, Support for International Change, Ocean Medicine Foundation, Free the Children, and Teach AIDS. He has organized conferences on international health, on Darwin, and on issues of development in Papua New Guinea. He is also a docent at Jasper Ridge Biological Preserve and at Año

Nuevo photography State Park. He is also an avid traveler, dish walker, photographer, and jumper.

Additional information can be found on his web site:  
<http://www.stanford.edu/~siegelr>

## **SOPHOMORE COLLEGE ASSISTANTS (SCAs)**

We are extremely fortunate to have two fabulous SCAs helping out with the course: Sarah Kaewert and Susmita Sridhar. They have put in a lot of work and thought in putting the course together and will continue to play a vital role during the course. In addition, they each bring various skills and expertise that will be invaluable to the course. The SCAs also provide examples of how one might successfully navigate one's way through the Stanford experience.

<b>Sarah Kaewert</b>	<a href="mailto:skaewert@stanford.edu">skaewert@stanford.edu</a>	(720) 938-7474
<b>Sushmita Sridhar</b>	<a href="mailto:sushds@stanford.edu">sushds@stanford.edu</a>	(650) 353-8021

## **GUEST SPEAKERS**

We have an impressive array of guest speakers with various areas of expertise. Since they are all volunteering their time and effort, we will accord them the highest level of courtesy and respect. Please be understanding with regard to the fact that some of them may overlap in terms of their presentation content and in terms of the fact the sequencing of their talks may not always be optimal due to the vagaries of peoples travel and work schedules. The details of who will be speaking when can be found online on the Google calendar for the course Google account to which you will be given access.

## **EMAIL**

Communication with students and course announcements will often be delivered by email. Students are expected to check their Stanford accounts every day AND respond.

## **EMAILING FILES**

In emailing or submitting electronic files, you should name them as follows:

Course – yourname - document title or subject key words - draft version - date

For example:

“measlessafari - Siegel – atypical measles – final draft –September 15, 2012.doc”

Although this is longer and annoying, it is extremely helpful and descriptive.

→ **Do not** name your file something like “siegel paper” or “final draft” or “presentation”.

If you are sending me a draft that is close in content to a previous draft, *please indicate the alterations* with the track changes command or comparable color annotation.

## **CLASS ACCOUNT**

The class account is [measlessafari@gmail.com](mailto:measlessafari@gmail.com). This will be the location for the course calendar, additional course information, and the course blog, as well as a repository for course assignments, and supplemental reading materials. For certain issues and additional readings, the coursework site will also be used.

## **COURSE READING**

We are quite fortunate in that SoCo ordered six books for the course. They are listed below. Despite the importance of the paramyxoviruses, there currently are no popular books on this subject. Therefore the books focus on aspects of history, vaccination, and an introductory textbook. We will supplement these with articles from the scientific literature and popular media as well as links to two online textbooks, various listserves, and pertinent web sites.

The following books are “required reading”. Students are expected to read four of the required books (or approved alternatives). Students are encouraged to make *extensive marginalia*.

- 1) *The Panic Virus: A True Story of Medicine, Science, and Fear* by Seth Mnookin
- 2) *Deadly Choices: How the Anti-Vaccine Movement Threatens Us All* by Paul A. Offit M.D.
- 3) *Vaccinated: One Man's Quest to Defeat the World's Deadliest Diseases* by Paul A. Offit
- 4) *The Vaccine Controversy: The History, Use, and Safety of Vaccinations* by Kurt Link M.D.
- 5) *Plagues and Peoples* by William H. McNeill (Oct 11, 1977)
- 6) *Fundamentals of Molecular Virology* by N. H. Acheson (Aug 30, 2011)

In addition, the following textbooks are available online through the Coursework site for :

*Measles: history and basic biology* vol 1, Diane Griffin and Michael Oldstone eds  
*Measles: pathogenesis and control* vol 2 , Diane Griffin and Michael Oldstone eds

<http://lmlib.stanford.edu/cgi-bin/Pwebrecon.cgi?BBID=290315>

From that link, students can click through and access the books online with a SUNet login.

## **COURSE LIBRARY**

The instructor will make available his large collection of materials on measles and virology.

## ORAL PRESENTATIONS

On the third day of class, students will choose two presentation topics: one on a specific paramyxovirus and one that focuses on a conceptual aspect of paramyxoviruses – a person, a geographic region, a historical event, a policy issue, a scientific concept, or a published paper. Topic lists will be distributed on a separate handout. By signing up for a given presentation date, students are **COMMITTING** themselves to be prepared to give a high quality presentation at that time.

Presentations should run no more than 15 minutes. The discussion might adhere to the following format:

- 1) Introduction of yourself
- 2) Why you chose this topic and why this topic should be of general interest.
- 3) Introduction and/or background to the topic
- 4) Main content
- 5) Summarization of the key information
- 6) Questions posed by the audience
- 7) Solicitation of questions

Other appropriate formats may be used.

In their presentations, students should:

- 1) Be sure to provide adequate background so that their audience will understand what follows
- 2) Emphasize key points
- 3) Realize that it is impossible to be completely thorough and some material needs to be omitted
- 4) Simplify the material if possible, but never at the expense of accuracy
- 5) Define terms that are new or unfamiliar
- 6) Answer questions from the audience
- 7) Pose provocative questions to the other students
- 8) Stimulate discussion of the topic

There is an Oral Communications Tutor (OCT), hired by Sophomore College to assist you with your every presentation need.

## **PRESENTATION STYLE (adapted from the vaccine revolution syllabus)**

Following are some specific points about style that you may wish to consider.

- 1) The extent of your preparation WILL show through your presentation. (For example, do not wait until the last minute to find out what a particular abbreviation means.
- 2) Use many resources, especially people, in trying to master the concepts in your talk.
- 3) Remember that visual aids can improve the understanding of your audience, cut down your need for notes, and improve the flow of your talk.
- 4) Try to include original (made by you) diagrams, flow charts, or tables that will facilitate your audience's grasp of the material.
- 5) You need not cover all aspects of your topic.
- 6) However, you should paint a *complete picture* of whatever you do decide to cover.
- 7) Do not bring up topics you are not prepared to talk about. (This is not to say you audience will not bring them up.)
- 8) Do not concede your shortcomings or your audience will focus on them. For example, avoid saying "I am sorry I did not enough time to really understand what the authors were doing when they..."

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Consider several different formats in your oral presentations. This will help you develop a style that most suits you. Things you may wish to vary from one presentation to the next include:

- a) the types of visual aids,
- b) the types of notes you use,
- c) the speed of your delivery,
- d) the way you dress,
- e) etc.

## **WRITE-UPS**

The write-up is an elaboration of the material presented in the PowerPoint presentations. The write-up should be approximately five pages (double spaced). The write-up should be content based *without repetition* in the introductions or summaries. Conclusions should be integrative and go beyond preceding material. The structure should be logical and clear. The style should be lively and engaging.



## **NEW AND HOT**

Every week, every student is expected to present three or more items of interest. These items should be related directly or indirectly to the field of measles. Items may fall within any of the following areas.

- New resources
- New discoveries
- New experimental research
- New events and their impact on culture
- New personal experiences related to the course topic
- Court cases
- Relevant outbreaks, aspects of eradication, other related infectious disease topics

New and hot items can be found in many places, but one excellent source is <http://www.google.com/alerts>.

Another is <http://www.promedmail.org/>.

## **CLASS BLOG: MEASLESSAFARI.BLOGSPOT.COM**

Students are expected to post at least three items per week on the class blog:  
**[measlessafari.blogspot.com](http://measlessafari.blogspot.com)**

The material posted to the blog should correspond to your *New and Hot* findings.

Do not use stories that have already been posted. Make sure to keep up with the blog to avoid such redundant posts.

Post early to avoid being “scooped”.

## **OBSERVATIONS**

Observations are 1-2 sentence reflections on course material. Students are expected to make 3-5 observations per day (September 4 through 20.)

Observations may be based upon the reading, web explorations, class trips, student presentations, etc. Observations may be quite directed or highly reflective. Observations are to be posted on Twitter.

## **TWITTER**

Students are expected to set up individual Twitter accounts and post their observations on a daily basis.

To set up an account, go to <http://twitter.com/>

To post to the class twitter, begin your twitter with “@measlessafari .

You can see the class posts at <http://twitter.com/#!/measlessafari> .

## **SPEAKER INTRODUCTIONS**

Each student will introduce one of the guest speakers. Some ingenuity and resourceful will often produce interesting introduction material. In the past, students have had considerable success in access information on the web and/or by consulting secretaries.

## **BOOK REVIEWS**

Students are expected to post at least two book reviews on Amazon or an equivalent web site. Books to review may be required course books or other approved related materials such as textbook chapters. Additional credit is given for additional book reviews.

## **WIKIPEDIA**

Each student is expected to create at least one Wikipedia entry related to the subject material of the class. Topics should be approved by the professor. We will provide assistance for those who have not previously created a Wikipedia entry.

## **TIMELINE**

Each student is expected to create a timeline with at least 10 events related to measles. These will be merged together into a master timeline.

## **VIRAL MODEL**

Students are required to build a model of a specific aspect of measles virus or viral family. This is intended to illustrate some of the properties of viral structure, viral symmetry, viral assembly, viral gene expression, or pathogenesis. Models should be accompanied by an explanation of the properties that your model illustrates as well as any problems that were encountered in the construction of the model. In doing your write-up, you should address the following issues:

a) Describe your model

If pertinent, discuss the use of colors and/or other visual effects.

b) What specific principles does your model clarify

Include any insights you derived from building your model.

c) What substantive questions does your model raise?

d) What are the shortcomings of your particular model?

e) Why did you select the particular materials used?

f) In general, what functions do models serve?

g) What are the advantages of static versus dynamic models?

Use a separate paragraph and section heading for each issue.

Every model should have a **title** and a **bibliography**.

Please put your name on all submitted work.

Students are encouraged to work together although each student must turn in a **separate** model and model write-up.

Students will each present their models and explain the significance of its construction and design at the model marathon (see below). Every presentation must include **3-5** computer projected **PowerPoint** slides as visual aids. For those who need it, supplemental instruction will be provided on the use of PowerPoint.

In summary, there are three parts to the model assignment:

a) the model

b) the write up

c) the presentation.

Please begin your presentation by introducing yourself and your model. Be sure to project and enunciate.

The instructor will assign topics although requests will be accepted. Any trades must be sanctioned by the instructor.

Models will be judged on their creativity, clarity, and utility.

We will visit the Cantor Art Museum to see examples of student viral models.

## **CONCEPT MAP**

Each student is expected to create a one page concept map related to the subject material of the class. Ideally, we will be able to link these together to create a megamap.

## **FINAL EXAMINATION**

Each student will write their own final exam and produce an appropriate answer key focusing on what they have learned in the course.

## **CLASS PARTICIPATION / CLASS DISCUSSIONS**

Students are expected to play an active role in the class discussions and debates. This includes raising pertinent questions in class, or after class. On a daily basis, students should be prepared to discuss at least one new and hot and one observation.

## **CLASS DEBATES**

The topic of measles has given rise to a number of vociferous debates both historically and at the present time. Some of these topics will be used to stimulate class discussion. Students may be assigned to research and defend particular positions regarding these controversies. Some of the controversies examined will include:

- Is it ethical to require vaccination?
- Should public figures be held to a higher standard in terms of factual information?
- What criteria should be used in funding scientific research?
- Are influential opponents of vaccinations (antivaccinationists) guilty of murder?
- Can measles be eradicated?
- Should resources be spent on eradication?
- Is vaccination a human right?
- Democratic vs Republican candidates – why is each better in terms of paramyxovirus (I have purposely left this ambiguous.)

## **BOOK / JOURNAL DISCUSSIONS**

We will have two formal book discussions over dinner scheduled throughout the course. Students **may** suggest which books to be discussed, but the most popular books will likely be selected. Reading the book of discussion is not required, but highly recommended to generate the most interesting discussion; bring questions, opinions, and reflections on the course reading to these book discussions.

We will also be informally discussing several scientific papers to familiarize you with experimental techniques related to current paramyxovirus research. The format of these "journal club" discussions will be described later, but plan on reading the assigned articles carefully before discussion with an emphasis on understanding key figures and the implications of the research.

## **COURSE FIELD TRIPS**

Course related field trips will include:

Cantor Art Museum – viral art exhibit  
Stanford Animal Facility  
Stanford Diagnostic Virology lab (Hillview)

Students are expected to attend.

The instructor will gladly accept suggestions for additional field trips and will work with the program staff to try and implement them.

Other possible venues include:

Global Viral Forecasting Institute (GVFI)  
Global Solutions for Infectious Diseases (GSID) - South San  
Francisco  
California Academy of Sciences  
Pediatric Infectious disease research lab

## **MOVIE NIGHTS**

Movie night will focus on infectious disease themes (possibly with other SoCos).

Candidate movies include:

- Contagion
- Outbreak
- Twelve Monkeys
- And the Band Played On

## **IMPROV NIGHT**

Stanford Improviser, Alexis Iuscutoff, will lead an improv theater workshop based on the key improv tenets of positivity, teamwork, creativity, and fun! These improv activities will help us get to know each other, take risks, listen to each other, and find inspiration in the unexpected. Activities will include, among other things: Saying Yes; Enemy Defender; Poison Arm Samurai; I am a Tree; and Doo-Run-Run. You'll leave the workshop feeling upbeat, inspired, confident, and excited!

For more information about the Stanford Improvisers, visit their website at [simps.stanford.edu](http://simps.stanford.edu) or email Alexis at [alexislu@stanford.edu](mailto:alexislu@stanford.edu).

## **PANDEMIC OR PANDEMIC II NIGHT**

We will spend an evening engaging in the online or board version of the game of world microbial domination.

## **OPTIONAL FIELD TRIPS**

A number of optional field trips will also take place. These trips have no direct relationship to the content of the course.

Students are strongly encouraged to attend (for fun and for bonding purposes).

Optional field trips may include:

- The Stanford Dish
- Jasper Ridge
- Arizona Garden
- PNG sculpture garden
- Outdoor sculpture tour
- Hoover Tower
- Palo Alto Baylands
- Año Nuevo

We will also accept suggestions for optional field trips.

## **ENRICHMENT LECTURES**

There are many lecture series and special lectures on campus with topics pertinent to vaccination, immunity, and infectious disease. We will announce such opportunities during class. You are also encouraged to let us know if you hear of any.

Possibilities include:

Medicine Grand Rounds (Wednesday at 8 am)

Pediatric Grand Rounds

Infectious Disease Grand Rounds (Thursday at 4:30)

ID fellows didactic rounds (Tuesday at 8 am)

etc.

## **WONDERFEST**

"Is Nature or Man the Most Effective Bioterrorist?" with Stanley Falkow and David Relman – a San Francisco event on September 23, 2012 (Sunday afternoon following Sophomore College)

<http://wonderfest.org/most-effective-bioterrorist/>.

## **BACK UP**

i have received far too many emails from students who have lost files (notes, presentations, photos) due to stolen computers and failed hard drives. Do not join this club. In particular, beware of iPad notes.

## DOSSIER

All students are required to keep a dossier of all their assignments and other work in the class. This should include copies of all your assignments and other work completed in conjunction with the course as well as photographs of all physical projects.

\*\*\*Please turn in an **electronic and a hard version of your dossier**

The dossier should include:

- A list of all work / table of contents
- 3 PowerPoint Presentations
- 2 topic write-ups
- Model picture and write-up
- New and hot blog entries
- Book reviews (if not part of new and hot)
- Observations / Twitter entries
- Introductions
- Wikipedia entries
- Debate notes
- Concept map
- Timeline
- Final exam
- Extra credit assignments including debates, videos, songs
- List of any additional evidence of initiative and/or scholarship including articles or books you have read
- A list of notable course events / favorite moments or activities
- A list of topics of particular interest in the course

Please turn your dossier in by Sunday September 23, 2012. Electronic copies can be upload to the dropbox on the Stanford coursework site. They can also be mailed to [measlessafari@gmail.com](mailto:measlessafari@gmail.com)

(Please do not send them to [siegelr@stanford.edu](mailto:siegelr@stanford.edu) or upload them to my personal dropbox account.)

The dossier is extremely useful in terms of potential letters of recommendation.

## PERMISSIONS

The dossier is for evaluation (and possible recommendations). However, as you know, I sometimes use student presentations as demonstrations or as parts of my



presentations - with attribution. As you saw, I try to maintain the student's formatting so it is obvious that it is not my work.

If you have any preferences regarding the possible use of your work, please let me know (especially emphatic no's or emphatic yes's). I will not use any work that you prefer not to share.

## **ADDITIONAL CONSIDERATION**

Student may distinguish themselves through the completion of extra assignments. A list of extra credit assignments may be distributed as a separate hand-out. All extra credit should be approved prior to completion.

Some options for extra credit include:

- Notable class participation
- Arrangement of an extra video session
- Arrangement of a guest speaker
- Arrangement of a field trip
- Additional presentations
- Additional book review
- Leading a book discussion
- Creating course related video or composing song or poem

Students may also do other optional assignments per arrangement with the instructor.

## **STUDENT VIDEO**

One of the highlights of a former seminar course was the creation of student videos. Examples will be shown in class. Students in *The Measles Safari* are encouraged to continue this tradition. Your imagination is the only imitation in terms of the content and format.

## **COOPERATION BETWEEN STUDENTS/WORKING TOGETHER**

I would like to simultaneously foster a spirit of friend competition and deep cooperation. I hope that all students will look out for the best interest of their fellow students while continuously "raising the bar."

Students are encouraged to work together on most phases of the course.

Even on cooperative assignments, students are **required** to compose assignments entirely **in their own words**. Again, this does not mean merely shifting a few words around. This will be strictly enforced.

## **PHOTOGRAPHY AND JUMPING**

During the quarter, students will be encouraged to take pictures and to jump. This is just a thinly veiled excuse to allow the instructor to do these things.

## **WEBSITES**

### **Websites –**

**These are places to look for information and for New and Hots for the blog**

Wikipedia:

Eg measles: <http://en.wikipedia.org/wiki/Measles>

Center for Disease Control and Prevention

<http://www.cdc.gov/>

World Health Organization

<http://www.who.int/en/>

Medscape

<http://www.medscape.com/infectiousdiseases>

ProMed (Program for Monitoring Emerging Disease) – web site and listserve

<http://www.promedmail.org/>

Google Alerts – email alerts on particular topics

<http://www.google.com/alerts>

International Committee on the Taxonomy of Viruses

<http://ictvonline.org/index.asp?bhcp=1>

Viralzone

<http://viralzone.expasy.org/>

## **ARTICLES ON PARAMYXOVIRIDAE**

### **Journal PDFs**

Please note: access to journal articles is often much easier if you search through the Lane Library portal:  
<http://lane.stanford.edu>

## **Measles**

William J Moss and Diane E Griffin “Measles” *Lancet* 2012; 379: 153–64

“Measles Outbreak Associated with an Arriving Refugee — Los Angeles County, California, August–September 2011” *Morbidity and Mortality Weekly Reports*, Vol. 61 / No. 21, June 1, 2012.

Tai-Ho Chen, MD et al “Measles Outbreak Associated With an International Youth Sporting Event in the United States, 2007” *The Pediatric Infectious Disease Journal* Volume 29, Number 9, September 2010, pp 794-800.

“Prolonged persistence of measles virus RNA is characteristic of primary infection dynamics” Wen-Hsuan W. Lin, Roger D. Kouyos, Robert J. Adams, Bryan T. Grenfell, and Diane E. Griffin, *Proceedings of the National Academy of Sciences*  
[www.pnas.org/cgi/doi/10.1073/pnas.1211138109](http://www.pnas.org/cgi/doi/10.1073/pnas.1211138109)

Diane E. Griffin, Wen-Hsuan Lin & Chien-Hsiung Pan, “Measles virus, immune control, and persistence” *FEMS Microbiol Rev* 36 (2012) 649–662 - Review Article

## **Control**

Global measles and rubella strategic plan : 2012- 2020  
[http://whqlibdoc.who.int/laneproxy.stanford.edu/publications/2012/9789241503396\\_eng.pdf](http://whqlibdoc.who.int/laneproxy.stanford.edu/publications/2012/9789241503396_eng.pdf)

Progress in global measles control, 2000-2010.  
<http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6104a3.htm>

Griffin D E, Lin W, Pan C. 2012. Measles virus, immune control, and persistence. *FEMS microbiology reviews* 36 (3): 649-662.  
[http://sfx.stanford.edu/laneproxy.stanford.edu/local?sid=stanford%3A1aneweb-search-pubmed&id=pmid%3A22316382&disable\\_directlink=true&sfx.directlink=off&issn=0168-6445](http://sfx.stanford.edu/laneproxy.stanford.edu/local?sid=stanford%3A1aneweb-search-pubmed&id=pmid%3A22316382&disable_directlink=true&sfx.directlink=off&issn=0168-6445)

## **Emerging paramyxovirus**

Hector C. Aguilar and Benhur Lee

Emerging paramyxoviruses: molecular mechanisms and antiviral strategies  
Expert Rev Mol Med. ; 13: e6. doi:10.1017/S1462399410001754.

<http://www.ncbi.nlm.nih.gov/laneproxy.stanford.edu/pmc/articles/PMC3253018/pdf/nihms343753.pdf>

Drexler, JF *et al.*

Bats host major mammalian paramyxoviruses.  
Nat Commun. 2012 Apr 24;3:796. doi: 10.1038/ncomms1796.

<http://www.ncbi.nlm.nih.gov/laneproxy.stanford.edu/pmc/articles/PMC3343228/pdf/ncomms1796.pdf>

## **Autism**

"Autism and measles, mumps, and rubella vaccine: no epidemiological evidence for a causal association." The Lancet, Volume 353, Number 9169. 12 June 1999

<http://www.iaomt.org/testfoundation/nolinkmmr.htm>

Mumps, measles, and rubella vaccine and the incidence of autism recorded by general practitioners: a time trend analysis

<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC26561/>

BMJ. 2001 February 24; 322(7284): 460–463.

## **People**

John F. Enders and measles virus vaccine--a reminiscence.  
Curr Top Microbiol Immunol. 2009 ;329:3-11.

## **PARAMYXO MOVIES, VIDEOS, YOUTUBES, PODCASTS**

Below is a list of videos and similar materials related to paramyxovirus.

### **Movies**

*Contagion*

<http://www.youtube.com/watch?v=bdzWcrXVtwg> (movie trailer)

## **YouTube: paramyxo and autism**

Seth Mnookin: Vaccines, Autism and Fraud  
<http://www.youtube.com/watch?v=jF7TJBDImoc>

[The infamous Oprah vaccination conversation]  
<http://www.youtube.com/watch?v=MP8nFGuGiM8>

[The Jenny McCarthy Song]  
[http://www.youtube.com/watch?v=0v\\_85tAey9s](http://www.youtube.com/watch?v=0v_85tAey9s)

[Autism Debate with Jenny McCarthy on The Doctors Part One  
<http://www.youtube.com/watch?v=6oEtF8FdqpA&feature=related>

Measles rash, symptoms, and complications video  
<http://www.youtube.com/watch?v=S14DDU3TNtY>

Measles, mumps, and rubella look for children  
<http://www.youtube.com/watch?v=3f4tsyz1K3E&feature=related>

Michael Specter: The danger of science denial  
[http://www.ted.com/talks/michael\\_specter\\_the\\_danger\\_of\\_science\\_denial.html](http://www.ted.com/talks/michael_specter_the_danger_of_science_denial.html)

## **Youtube: humorous**

Look Around You – Germs  
<http://www.youtube.com/watch?v=57eh-Ty65u4>

Viral replication (miniBob)  
[http://www.youtube.com/watch?v=Cu\\_uxYW5ixl](http://www.youtube.com/watch?v=Cu_uxYW5ixl)

## **Podcasts**

Mark Crislip's *Persiflagger's Puscast*

Vincent Racanello's *This Week in Virology*