

# Thrombolina Casts Her Nets: Blood Clotting Activity Suggestion Activity 1C

## Note:

This activity suggestion describes how specific content might be taught to middle school students. It does not contain fully developed lesson materials, which we hope to develop under future funding in this content area. Any feedback on how you are able to use this lesson suggestion would be greatly appreciated. Your comments can be sent to us at [teachhealthk-12@uthscsa.edu](mailto:teachhealthk-12@uthscsa.edu).

## Activity Focus:

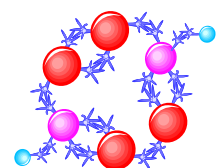
The focus of this activity is the investigation and modeling of the steps in the blood clotting process. Blood clotting, or as it is known to scientists and health professionals, hemostatic process in the body, is a complex chain of events involving many players. This activity deals specifically with the *clotting cascade* in which many of these players interact to form a clot in a fascinating sequence of events. The interplay of the clotting factors and other substances involved in forming a life saving (or life ending) thrombus involves domino to domino like activation sequences and feedback loops, one of the miracles of homeostasis in our bodies which, like most other miracles of the human anatomy and physiology, goes on unrecognized by the average person. This activity will bring to light the processes of clot formation and the health implications associated with the process. Students investigate and model the hemostatic process and come away with a model that will continue to remind them of what is occurring in their bodies each time they get a cut and hopefully a new sense of wonder at one of the amazing processes that protect the homeostasis of our bodies.

## Activity Rationale:

Our bodies have an amazing array of defense mechanisms to protect us from disease and injury. One of these mechanisms, hemostasis, is responsible for maintaining the integrity of our circulatory system when it is breached by an injury. A physical or chemical trauma to a blood vessel begins this hemostatic mechanism, which in most cases (e.g. a trauma of some type) can save our life, but in others (e.g. atherosclerosis, deep vein thrombosis or pulmonary embolism) can severely compromise our health.



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Cast Your Net: Adventures With Blood

Hemostasis simply means “blood stopping”. When a blood vessel is injured and blood is escaping hemostasis is the process responsible for stopping blood leakage. An understanding of these processes provides an insight into the homeostatic processes of the body, a basic understanding of how to appropriately respond in a hemostatic emergency, knowledge of how structure and function complement one another in the cells, factors and proteins involved in the process, and an awareness of how lifestyle choices can affect health over our lifetime. At the same time students practice crucial intellectual/academic skills such as sequencing, analyzing, critical thinking and constructing models.

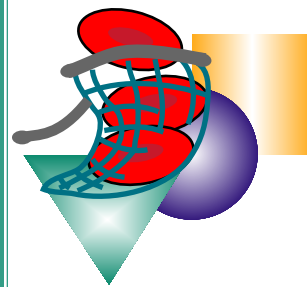
## Suggested Methodology:

*Activity 1A: P.L.E.P.: Parts of the Blood* and *Activity 1B: Gammagauntlet: Fighting Infection* in the *Positively Aging®/M.O.R.E.* Curriculum Framework are activities which precede this one and provide a good foundation for parts of the blood and its role in immunity.

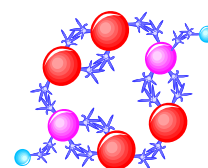
In order for students to gain an understanding of the hemostatic process, they will discover how blood clotting occurs by *using a series of cards* containing illustrations. These cards could be prepared by using images from the Internet or a book. With no prior instruction, students will sequence the cards by observing critical attributes of the cards. Students will write a brief rationale for their sequence. With the entire class, the teacher will process out the activity so students can see where their thinking was correct and where they need to make revisions. The teacher can compile a background resource for students to use as they process out the activity. Some excellent sources are listed in the **Activity Resources** section to help with this background resource.

As an alternate activity structure, students can conduct independent research on specific parts of the clotting process. They can create an illustration of their part of the clotting process and as each group presents their findings and illustrations, the illustrations can be posted around the classroom to create a large illustration of the stages of blood clotting.

Following the sequencing activity and/or the independent research, students will construct a model of a blood clot with its major components; platelets, fibrin, and clotting factors. The blood clot model will adorn a band aid box to remind students of the hemostatic process each time a band aid is needed. Buttons represent platelets, yarn fibrin and the matrix material the clotting factors. Elastack® makes for a good matrix though you may wish to experiment with other materials. Students could also be challenged to construct their own unique models of a blood clot, choosing their own materials and presenting the process via a number of venues. This last option is a good application of differentiated instruction.



# Activity Suggestion, continued



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## Activity Resources:

Merck Manual Online Library's information on bleeding and clotting disorders:

<http://www.merck.com/mmhe/sec14/ch173/ch173a.html>

A good source for basic information on clotting from the FDA:

[http://www.fda.gov/fdac/features/2004/604\\_vein.html](http://www.fda.gov/fdac/features/2004/604_vein.html)

Medline Plus – Good summary of clotting processes:

<http://www.nlm.nih.gov/medlineplus/ency/article/001124.htm>

Sources for Elastack®: The Compleat Sculptor:

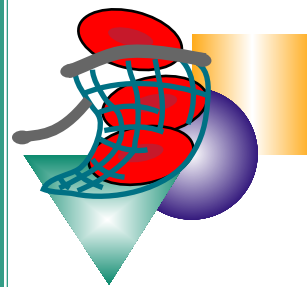
[http://www.sculpt.com/catalog\\_98/RUBBERS/Elastack.php](http://www.sculpt.com/catalog_98/RUBBERS/Elastack.php)

Industrial Plastics:

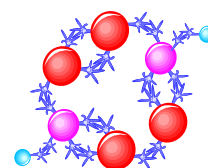
Elastack: Industrial Plastics, 309 Canal Street, New York, NY (212)226-2010  
OR Sutton Technologies, 97 Leslie Road, Bldg. G, North East MD, 21901 @  
410/287-7900

Detailed Instructions (pdf) for Elastack:

[http://www.sculpt.com/technotes/Tech\\_Sheets/TECH\\_SHEET\\_Elastack.pdf](http://www.sculpt.com/technotes/Tech_Sheets/TECH_SHEET_Elastack.pdf)



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