



AVHTM Newsletter

Special Events of Interest:

- ICVHTM 21st International Conference on Veterinary Hematology and Transfusion Medicine:
March 4-9, 2019
(Rio de Janeiro, Brazil)
- ACVECC VetCOT Veterinary Trauma & Critical Care Symposium:
April 12-14, 2019
(Las Vegas, NV)
- American College of Veterinary Internal Medicine (ACVIM) Forum:
June 5-8, 2019
(Phoenix, AZ)
- European College of Veterinary Emergency and Critical Care (ECVECC) Congress:
June 6-8, 2019
(Tallinn, Estonia)
- International Veterinary Emergency and Critical Care Society (IVECCS) Meeting:
September 6-10, 2019
(Washington, DC)
- Congress of the European College of Veterinary Internal Medicine – Companion Animals (ECVIM-CA):
September 19-21, 2019 (Milano, Italy)

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ACVECC VetCOT Veterinary Trauma & Critical Care Symposium

This fifth annual event is taking place April 12-14, 2019 in Las Vegas. The conference will be held in conjunction with the Trauma, Critical Care & Acute Care Surgery Conference (April 14-17, 2019). This is a unique opportunity for those with an interest in trauma and surgery to share ideas, experiences, and expertise in a smaller forum conducive



to discussion and collaboration. While the target audience is veterinary specialists (DACVECC, DACVS, DACVAA), residents (ACVECC, ACVS, ACVAA), emergency clinicians, ECC technicians, and allied specialists and residents (ACVO, ACVIM-neurology,

ACVSMR, ACVR) are strongly encouraged to attend. And while the focus is small animal trauma, our large animal colleagues are also encouraged to attend. Dr. Erin Long will be presenting "Novel Transfusion Methods" on April 13th and more information regarding the schedule and registration can be found at <http://vetcot.org/index.php/category/conference/>.

AVHTM Updates

Our group is continuing to grow – we have more than 200 members! Recently, our email group has shared discussions on several topics including rabbit transfusions, blood banking equipment, blood banking protocols, use of breeding dogs as donors, and disposal of expired blood products. We encourage AVHTM mem-

bers to continue using this fantastic resource by emailing questions or sharing ongoing research endeavors with the group. Please note that access to the Google Group is only for those with membership fees in good standing. Previous discussions can be accessed online signing into your Google account at [https://](https://groups.google.com/)

groups.google.com/.

We also have more than 700 followers on Facebook and have good engagement with our posts in terms of people liking or sharing them. The three most engaging posts from the last few months are "Brief communication published in the Journal of Veterinary Emergency and Critical Care (continued on page 4)

Mixed-field pattern in gel agglutination for feline and canine blood typing, cross-matching, and antibody identification

By: Dr. Eva Spada and Prof. Daniela Proverbio (University of Milan)

The gel agglutination test detects RBC antigen-antibody reactions using a chamber filled with polyacrylamide gel. The gel acts as a trap: free unagglutinated RBCs form pellets in the bottom of the tube (negative reaction) and agglutinated RBCs remain at the top of the tube or are trapped in the gel (positive reaction). Positive reactions are graded 4+, 3+, 2+, 1+, according to size of the agglutinates.

Gel technology is approved for ABO grouping, Rh typing, DAT, antibody screening, antibody identification, and compatibility testing. It is used in veterinary medicine for DEA 1, 4, 7, DAL and Kai canine blood typing and in A, B, AB and Mik feline blood typing and antibody identification.

At University of Milan Veterinary Transfusion Research Laboratory (REVLab), we have been using this technique for a decade during blood typing, cross-matching, and alloantibody research. The main problem with this technique is the mixed-field reaction, when a layer of agglutinated RBCs forms at the top of the gel and a pellet of unagglutinated cells is seen at the bottom of the microtube (Figure 1).

In human medicine, gel mixed-field patterns arise from:

- Mixed RBCs populations due to recent blood transfusions (presence of circulating donor red cells in recipient), transplanted bone marrow or peripheral blood stem cells of a different ABO type, exchange transfusions, fetal-maternal hemorrhage, blood group chimerism in fraternal twins, or mosaicism arising from dispermy^{1,2}
- False-positive reactions when incompletely clotted serum is used in the gel test⁵
- Some ABO subgroups (e.g., A3)²
- Disease states that alter RBC antigens and result in progressively weaker reactions or acquired pseudoantigens (e.g., leukemia, Hodgkin's disease, thalassemia)³



During our preliminary study of AB system feline blood typing, 136 samples were typed simultaneously with the tube and gel agglutination technique; 24 samples showed a mixed-field agglutination pattern. If the mixed-field pattern was interpreted as a negative result, 135/136 (99.3%) samples had concordant results between gel and tube technique (the gold standard for feline blood typing).⁴

Mixed results have been obtained by other veterinary researchers. Euler et al observed unexplained split reactions in a few cases during Kai canine blood typing, with most cells located on top of the gel despite a few RBCs pelleted. These cases were designated as 4+ and these dogs were neither previously transfused nor had any illness.⁵

Additional studies are needed to understand the significance of mixed-pattern field in gel technology in veterinary transfusion medicine.

Figure 1 (above): Example of feline blood typing with gel agglutination technique. Sample n. 20 was AB with agglutination reaction of strength 3+ and 4+ in column labeled A and B, respectively and no agglutination appeared in control microtube (labeled C). Sample n. 21 was positive (4+) in column A and mixed-field in column B. This sample was typed as blood type A with tube agglutination, the gold standard technique.

References

1. Cooling L. ABO, H, and Lewis Blood Groups and Structurally Related Antigens. In: Fung, MK, Grossman BJ, Hillyer CD, Westhoff CM, 2014. AABB Technical manual, 18th ed, Chapter 12, pp 291-315.
2. Walker PS, Harmening DM. Other technologies and Automation. In: Harmening, DM, 2012. Modern Blood Banking & Transfusion, 6th ed, Chapter 12, pp 273-287.
3. Harmening DM, Forneris G, Tubby BJ. The ABO blood group system. In: Harmening, DM, 2012. Modern Blood Banking & Transfusion, 6th ed. Chapter 6, pp 119-148.
4. Spada E et al. Comparison of conventional tube and gel-based agglutination tests for feline AB system blood typing. 60th AAVLD/121st USAHA Annual Meeting, San Diego, CA, USA, 12 -18 October, 2017.
5. Euler CC et al. Survey of Two New (Kai 1 and Kai 2) and Other Blood Groups in Dogs of North America. J Vet Intern Med 2016, 30:1642–1647.

Recently Published Articles

The articles listed below are those published **October 2018 – December 2018** in the field of veterinary transfusion medicine, blood banking, and hemostasis:

- Platelet-rich Plasma and Other Hemocomponents in Veterinary Regenerative Medicine. Tambella AM, et al. [Wounds](#). 2018 Nov;30(11):329-336.
- Analytic characterization of flow cytometric assays for detection of immunoglobulin G on canine erythroid cells, including detection of dog erythrocyte antigen 1 on erythroid precursors. Lucidi CA, et al. [Am J Vet Res](#). 2018 Nov;79(11):1123-1132.
- Use of platelet-rich plasma for the treatment of prostatic cysts in dogs. Bigliardi E, et al. [Can J Vet Res](#). 2018 Oct;82(4):264-270.
- Effects of 6% tetrastarch or lactated Ringer's solution on blood coagulation in hemorrhaged dogs. Diniz MS, et al. [J Vet Intern Med](#). 2018 Nov;32(6):1927-1933.
- Application of Platelet-rich Plasma and Tricalcium Phosphate in the Treatment of Comminuted Fractures in Animals. Szponder T, et al. [In Vivo](#). 2018 Nov-Dec;32(6):1449-1455.
- Xenotransfusion with packed bovine red blood cells to a wildebeest calf (*Connochaetes taurinus*). Buck RK, et al. [J S Afr Vet Assoc](#). 2018 Oct 17;89(0):e1-e6. doi: 10.4102/jsava.v89i0.1669.
- Prevalence of naturally occurring non-AB blood type incompatibilities in cats and influence of cross-match on transfusion outcomes. McClosky ME, et al. [J Vet Intern Med](#). 2018 Nov;32(6):1934-1942.
- In vitro hemolysis of stored units of canine packed red blood cells. Ferreira RRF, et al. [J Vet Emerg Crit Care](#). 2018 Nov;28(6):512-517.
- Ex vivo evaluation of the efficacy of canine fresh-frozen plasma thawed using a microwave plasma defroster. Turner MA, et al. [J Vet Emerg Crit Care](#). 2018 Nov;28(6):603-607.
- Comparison of cross-matching method for detection of DEA 7 blood incompatibility. Spada E, et al. [J Vet Diagn Invest](#). 2018 Nov;30(6):911-916.
- Detection of parvovirus and herpesvirus DNA in the blood of feline and canine blood donors. Marenzoni ML, et al. [Vet Microbiol](#). 2018 Oct;224:66-69.
- Pharmacokinetics of tranexamic acid in healthy dogs and assessment of its antifibrinolytic properties in canine blood. Osekavage KE, et al. [Am J Vet Res](#). 2018 Oct;79(10):1057-1063.
- Long-term postoperative effects of administration of allogeneic blood products in 104 dogs with hemangiosarcoma. Ciepluch BJ, et al. [Vet Surg](#). 2018 Nov;47(8):1039-1045.



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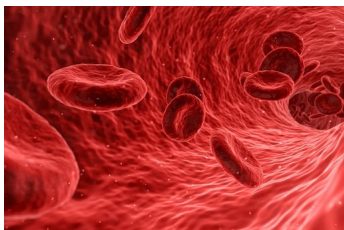
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AVHTM is an IRS approved 501(c)(3) nonprofit professional association composed of veterinarians, hematologists, academics, veterinary technicians, blood bankers, and interested public who desire to further scientific advances in transfusion medicine and veterinary hematology.

We engage in veterinary research, promote industry standards, develop guidelines for canine and feline blood collection and processing, and publish scientific research in peer-reviewed publications.

Visit us online to learn more about AVHTM!

AVHTM Updates (continued from page 1)

suggests that a microwave plasma defroster is a safe and effective way to thaw canine fresh frozen plasma" (posted December 28), "Take this quiz from Clinician's Brief to test your knowledge of canine and feline blood products!" (posted December 11), and "Recent study from Vet Surg investigated etiology of hemorrhage in small versus large dogs with spontaneous hemoabdomen and found that 'Small dogs had a lower rate of splenic hemorrhage and higher rates of hemorrhage from liver and other sites compared to large dogs. Etiologies other than splenic hemangiosarcoma were common, particularly among dogs weighing ≤ 20 kg.'" (posted November 27). Please 'like' or 'follow' us on Facebook and feel welcome to post links, images, and questions pertinent to veterinary hematology and transfusion medicine.

MEMBERSHIP BENEFITS

As an AVHTM member, you are eligible for the following:

- Reduced IVECCS registration fee (veterinarians save \$100 and technicians save \$25!)
- Access the a "Members Only" section of the AVHTM website, which includes access to:
 - o Other AVHTM profiles
 - o PubMed articles
 - o Forum for posting questions, cases, and research
- Ability to ask and answer questions posted to the AVHTM members only email group.

Please feel welcome to share this newsletter with interested colleagues and encourage them to become an AVHTM member!