THE NEW TEXAN
Texas State Society of American Medical Technologists

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**Articles**

**Probiotics: Immunological Responses and Therapeutic Effects of Probiotics on GI Tract Diseases**
Arnoldo Rodriguez
CE #31-301-17
(1.5 CE)

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By Taffy K Durfee
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**Spring/Summer 2017 / TxSSAMT**
A Message from the 

President

Kat Fryar

Happy New Year!

I’d like to take the opportunity to introduce the 2017-2018 Board of Directors and Committee chairs.

President: Katrina Fryar, MT
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Membership Chair and Audit Chair: Kimberley Derschuck, RMA
Nominations Chair: Kat Fryar

For Employment Information

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14330 Hollypark Drive • Houston, Texas 77015
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I am very excited to be part of such a great group of people working to help our membership. Thank you to our past president Taffy Durfee for all that she has done!

The Spring TxSSAMT Conference will be hosted by Ron White on April 28-29, 2017 at the Courtyard Fort Worth at Alliance Town Center in Fort Worth, Texas. The hotel room rate is $119 per night plus tax for a king or double bed. Be sure to mention the block code, TxSSAMT Convention, for the discounted rate. The deadline is March 28, 2017. We have setup online registration. Please check the website for more information! If you are interested in being a delegate to the National Convention, we will have a signup sheet available.

The 79th Educational Program and National Meeting will be held in Kansas City, Missouri on July 9-13, 2017 at The Intercontinental Hotel at the Plaza. The hotel room rate is $129 per night plus tax. The Early Bird Registration is $225 for the full week if the registration is received by May 1, 2017. The preliminary schedule has been posted on the National website.

For continuing education credits, don’t forget to fill out the free CEU article questions in the journals and send them in.

Our state is in need of a new pin!! So we are offering a pin design competition! A TxSSAMT member can design a state pin and email their work to me, Katrina Fryar. The designs will be voted on by the board and the winner is awarded a lifetime of free conference registrations. The winner will be announced at the Fall 2017 Conference. So have fun and let the imaginations flourish!! Can’t wait to see what you think represents our great state!

We would love to see you at one of the conferences!

Thank you,
Kat Fryar, MT
This will be your year of OPPORTUNITY. There is a wave of excitement sweeping across our Nation. AMT is alive and doing well. Our membership exceeds 78,000 and is growing. We learned of this awesome fact at the 2017 Spring BOD/Council meeting that just concluded.

The excitement is building for our 2017 Nat’l Convention, to be held at the Intercontinental Hotel at the Plaza in Kansas City, July 9-13. Start making your plans to attend by taking advantage of the early bird registration discount of $225.00. The registration fee after May 1 goes to $425.00. So start making your arrangements and save some money. I am delighted to announce that the 2018 Nat’l Convention will be held in Washington DC over the 4th of July. There will be fireworks in the sky and in the city, but regardless of your political preference, it will be an awesome convention.

All but 2 states are now part of centralized banking with AMT. We will once again conduct leadership training in Kansas City. Topics include “What are you doing with my money”, “CEU’S are your responsibility”, and “driving thru the AMT website”.

Be faithful to your state societies, attend the meetings to support your leadership. I will look for you all in Kansas City, a I stated at the beginning of this message. MAKE this your year of OPPORTUNITY. AMT is the choice for Allied Health Professional Certification.

Respectfully,
Randy Swoipes MT
Central District Councillor

A common question that I get is how to get Continuing Education credits or points.

The better question is how to get them for free! The easiest way is employment in your field of certification. Just print and fill out the “Employment Verification” form, then enter into AMTRAX for up to 6 hours per year. Note that this is a recent change from AMT.

You can go to this website and see what all qualifies for CEUs such as Professional Education, Authorship of Written Works, Instructional Presentations etc. The Employment Verification Form is also here http://www.americanmedtech.org/StayCertified/QualifyingActivities.aspx

People sometimes send in CEU article’s from AMT/AMTIE’s Journal of Continuing Education. Please note that these are either entered online, or mailed in for a fee to AMTIE, not the Texas State Society CE Chairperson. These are great articles for a small fee.

The New Texan features 3 FREE CEUs per journal. Below are all of the old journals of the New Texan. You can print the answer sheets, and send them all to the Current CE Chair listed in the front of the Journal (currently Alfonso Clemmings”, not the past education person listed on the article). Unless otherwise noted, they are worth 1 hour per article. http://www.americanmedtech.org/beinvolved/statesocieties/Texas/newsletter.aspx

Also, the site CDC.gov has free CEUs, but they tend to be difficult. I would also encourage you to write an article for The New Texan to 10 points per article. Write about something in your discipline, and submit to an officer or the Education Committee Chair. Or sign up to give an educational lecture at one of our conventions by contacting the Convention Coordinator.

Hope this Helps,

T.J. Weatherly
Past-TXssAMT Education Chairman
Treasurer
INTRODUCTION

The lower gastrointestinal tract (GI) houses a diverse population of microorganisms: pathogenic, opportunistic pathogens, or beneficial organisms; organisms that inhabited the intestine right after birth. In the sense of probiotics, foods supplemented with a certain strain can increase the variety of beneficial organisms present, but for the most part gut flora that have predominated in the lumen after birth will be found in higher amounts. These organisms are constantly modifying the environment within the lumen of the intestines and influence the function of enterocytes; altering physicochemical conditions within the gut and stimulating responses by the host organism.1 The way probiotics interact with the body, could potentially be used as treatments for Inflammatory Bowel Diseases (IBD) and advance immunological function/development, improving the quality of life of a patient afflicted with the disease. Probiotic microbiota provide direct and indirect immunity to the host by either attaching to bacterial sensors in the intestinal epithelial cells — activating cytokines that influence antimicrobial activity; or provide indirect protection by competing with pathogenic bacteria for growth in the lumen of the intestines, and preventing these harmful pathogens from proliferating and invading the organism.1,2 By understanding how probiotics interact with the cellular membranes in the lower GI tract, further progress in medicine will be achieved; improving immune function and reducing incidence of GI tract diseases.

CHARACTERISTICS OF THE IMMUNE SYSTEM

Organisms considered probiotic are often members of the genera Bifidobacterium or Lactobacillus. It is important to note that growth of these bacteria can be facilitated by ingestion of prebiotics — nutrients that are favored by anaerobic microorganisms and produce by-products non-toxic to the host.1 Dietary fiber is a known nutrient to produce short chain fatty acids (SCFAs), like butyrate, when fermented in the lumen. By doing so, probiotics alter the environment, making it suitable to outgrow pathogenic colonies. Other nutrients, like fructans, can't be digested by human pancreatic enzymes or brush-border membrane enzymes; providing food for probiotic species, helping proliferation, and outgrowing pathogenic species.1,3

Figure 1:
The intestinal lining contains many cellular components that activate actions of both the innate and adaptive immune system. The innate immune system comprises of phagocytic cells: monocytes that can differentiate into macrophages; Natural Killer cells (NK); granulocytes such as neutrophils, eosinophils, and basophils that do not provide specific target-recognition; they act as the first line of defense for the body. Antigen-presenting cells can be seen in gut-associated lymphoid tissue (GALT) that can generate an immune response signaling macrophages, M-cells in the Peyer’s patches of the intestine, and Dendritic Cells (DC), a major antigen-presenting cell group. DCs are activated through Pattern Recognition Receptors (PRR), depending on stimuli, activate pro-/anti-inflammatory responses through a subset of CD4+T-helper (Th), T-regulatory (Treg), and release a variety of interleukins (cytokines that stimulate cell-mediated and humoral immunity) and are used for signaling and stimulation of other cellular members of the immune system (Fig. 1). Adaptive immunity begins immediately after birth, and continues in early stages of the life cycle. Therefore, consideration for supplementing probiotics at an early age could help develop better immunity.

PROBIOTICS AND DEVELOPMENT OF IMMUNE SYSTEM

Similar to how pathogenic organisms induce responses and develop the adaptive immunity, it is theorized that probiotics provide for the signaling components recognized by the immune system and improve regulation. West et al., examined whether intake of probiotics during the time an infant is weaning would influence T-cell function and increase immunity leading into childhood. The study eliminated bias by performing a double-blind intervention trial; the experimental design involving infants who did not present allergic reactions were placed in separate experimental groups. The groups were either fed placebo cereals, or supplemented cereals containing Lactobacillus paracasei for an 8 month intervention trial. Important factors that remained constant in both groups were: gestational age, birth weights, gender, and environments, which would potentially skew results or create bias. The cells examined in the study were Th0, Th1, Th17, and Treg cells for their interplay in moderating inflammatory and autoimmune responses. In order to evaluate competence of the adaptive immune system, the study assessed the capability of peripheral blood mononuclear cells (PBMC) to respond to specific T-cell stimulation in both the placebo group and the supplemented group. Interleukin markers for specific T-cell stimulation were recorded and are as follows: IL-17A as a marker for Th17, IL-10 as a marker for Treg, IL-4 as a marker for Th2, INF-gamma as a marker for Th1. The data calculated from these markers would indicate response to stimulus using anti-CD3 monoclonal antibody plus anti-CD28, as well as the cytokine mRNA expression level in PBMCs after stimulation.

At 5.5 months of age, INF-gamma, IL-17A, and IL-2 response to stimulation of anti-CD3 monoclonal antibody plus anti-CD28 (73/77, 52/77, and 76/77, respectively) with little or no IL-4 and IL-10 responses. Responses then increased significantly at 13 months of age for INF-gamma, IL-17A, IL-2, and little increase in IL-4. Cytokine pattern correlated with that of adults, in which response levels were significantly higher for Th0 (IL-), followed by Th1 (INF-gamma), Th17 (IL-17A), Th2 (IL-4), and Treg (IL-10). IL-2, IL-17A, IL-10, and IL-4 mRNA provided higher levels of interleukins in the placebo group than in the probiotic group at 13 months of age indicating that feeding probiotic supplement to infants during weaning saw a trend of decreasing Th0 response and increase the Th1 and Th17 responses. The study also examined maturation of T helper cell’s response upon vaccination with the protein antigen tetanus toxoid. After one injection of the tetanus toxoid (5.5 months of age), only IL-2 and IL-10 were significantly above those that were un-stimulated cells. In correlation, 50% of infants showed INF-gamma and IL-4 stimulation, but no IL-17A at 5.5 months of age. After 13 months (vaccination complete and levels of TT-specific IgG concentrations above 0.1 IU/ml, i.e. protective immunity), INF-gamma, IL-2, and IL-4 levels increased when compared to those of only one injection; IL-10 and IL-17A did not change significantly. Finally, a comparison between concentrations of antibodies to TT and mRNA levels in response to antigen stimulation was conducted for both placebo and probiotic group and results indicated significant expression of IL-2 and INF-gamma mRNA expression, while the other cytokines were not significant because of non-responders following tetanus toxoid injection. It was concluded that after 9 months, infants consuming L. paracasei maintained a stronger capability to generate suitable Th cell response against specific antigens. Probiotic’s Effects on Bacterial Translocation, Systemic Infection & Biotherapeutic Effects

Protection of the intestinal barrier is proposed to be increased by certain probiotic agents; therefore Generoso et al. investigated the effects of probiotics on bacterial translocation and intestinal integrity. The researches aimed to figure out if there was a difference between viable or heat-killed Saccharomyces cerevisiae and would the probiotic supplement sustain intestinal barrier integrity, prevent bacterial translocation (BT). By definition, probiotics are living microorganisms in which provide a health benefit to the host when administered in adequate amounts. Saccharomyces boulardii is a yeast strain found in lychee fruit around Indochina that is locally used for digestive ailments, is the also the only yeast commercialized as a probiotic for humans. S. cerevisiae is nearly genetically identical to S. boulardii; therefore, the study also questioned whether other non-pathogenic yeast could possess bio-therapeutic properties as well. The mice used in the experiment were placed in four different groups: mice undergoing a
laparotomy procedure where the ileum is manipulated but not ligated; mice undergoing laparotomy with intestinal obstruction; mice supplemented with *S. cerevisiae* and intestinal obstruction; and mice with heat-killed organism of *S. cerevisiae* and intestinal obstruction.\(^5\) They introduced \(^{99m}\text{Tc-}E. \text{coli}\) as the invasive organism ten days after feeding supplement. The experiment design removes most bias from the experiment, but it seems that due to small number of sample mice (five mice per group) could radically skew results. Results, however, did provide a trend of significant data due to the effect of probiotics. The study showed higher uptake of \(^{99m}\text{Tc-}E. \text{coli}\) in the tissues than in the control (CTL) observed in Table 1 due to the intestinal obstruction.\(^5\) On the contrary, both the groups with heat-killed *S. cerevisiae* and viable *S. cerevisiae* showed significant decrease in \(^{99m}\text{Tc-}E. \text{coli}\), and noticeable but not significant trends with the other tissues. Various immune factors such as slgA, IL-10 and INF-gamma were investigated to see whether immune response as a proposed method of keeping intestinal integrity while attacked by a pathogenic organism (Table1).

In Table 2, the anti-inflammatory cytokine (IL-10) levels significantly increased for the viable and heat-killed *S. cerevisiae* possibly indicating stimulatory effect for the increased level of INF-gamma. INF-gamma, the pro-inflammatory cytokine was stimulated in response to intestinal obstruction compared to the control group. The data collected for slgA was intriguing because slgA is commonly associated with the mucosal membrane in the lumen of the intestines, and only the viable for of the supplement *S. cerevisiae* expressed a significant increase.\(^5\) This concludes that there was more intestinal integrity for the viable supplemented *S. cerevisiae* group that resulted in less bacterial translocation.

### Table 1:

<table>
<thead>
<tr>
<th></th>
<th>CTL (cpm/g or cpm/ml)</th>
<th>IO</th>
<th>IO+ SUPPL.</th>
<th>IO +HEAT-KILLED</th>
</tr>
</thead>
<tbody>
<tr>
<td>MLN</td>
<td>85.22&lt;sup&gt;a&lt;/sup&gt;</td>
<td>845.83&lt;sup&gt;b&lt;/sup&gt;</td>
<td>88.44&lt;sup&gt;a&lt;/sup&gt;</td>
<td>98.70&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>SPLEEN</td>
<td>23.75&lt;sup&gt;a&lt;/sup&gt;</td>
<td>676.25&lt;sup&gt;b&lt;/sup&gt;</td>
<td>151.13&lt;sup&gt;a&lt;/sup&gt;</td>
<td>220&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>LIVER</td>
<td>473.26&lt;sup&gt;a&lt;/sup&gt;</td>
<td>1794.14&lt;sup&gt;b&lt;/sup&gt;</td>
<td>856.23&lt;sup&gt;a&lt;/sup&gt;</td>
<td>959.44&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>LUNG</td>
<td>152.08&lt;sup&gt;a&lt;/sup&gt;</td>
<td>629.58&lt;sup&gt;b&lt;/sup&gt;</td>
<td>122.42&lt;sup&gt;a&lt;/sup&gt;</td>
<td>112.32&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>BLOOD</td>
<td>150.8&lt;sup&gt;a&lt;/sup&gt;</td>
<td>465.81&lt;sup&gt;b&lt;/sup&gt;</td>
<td>279.11&lt;sup&gt;a&lt;/sup&gt;</td>
<td>273.53&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

Table 1: Presents bacterial translocation by the circulation of \(^{99m}\text{Tc-}E. \text{coli}\) within the host in different tissues examined by radiolabeling.\(^5\) Statistically significant data is presented as a,b.

### Table 2:

<table>
<thead>
<tr>
<th></th>
<th>CTL</th>
<th>IO</th>
<th>IO+ SUPPL.</th>
<th>IO +HEAT-KILLED</th>
</tr>
</thead>
<tbody>
<tr>
<td>INF-gamma (pg/ml)</td>
<td>65&lt;sup&gt;a&lt;/sup&gt;</td>
<td>159&lt;sup&gt;b&lt;/sup&gt;</td>
<td>178&lt;sup&gt;b&lt;/sup&gt;</td>
<td>169&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>slgA (mcg/g)</td>
<td>736&lt;sup&gt;a&lt;/sup&gt;</td>
<td>742&lt;sup&gt;a&lt;/sup&gt;</td>
<td>1,248&lt;sup&gt;b&lt;/sup&gt;</td>
<td>973&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>IL-10(pg/ml)</td>
<td>29.58&lt;sup&gt;a&lt;/sup&gt;</td>
<td>50.75&lt;sup&gt;b&lt;/sup&gt;</td>
<td>102&lt;sup&gt;c&lt;/sup&gt;</td>
<td>104&lt;sup&gt;c&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

Table 2: Presents the levels of cytokine protein release. INF-gamma is significantly different in Groups 2,3, and 4. SlgA is significantly higher in Group 3, and IL-10 expression is significantly higher then Group 1 for Groups 2,3 and 4.\(^5\)

*S. cerevisiae*, is also believe to improve immune function to help manage the organism afflicted with a parasitic infection. For this study, *Trypanosoma brucei*, more commonly known as the African Sleeping Sickness was used to test the effectiveness of probiotics with systemic infections.\(^6\) *S. cerevisiae* is known for anaerobic fermentation and lactic acid to help prevent a hospitable environment for pathogenic organisms; at the same time they stimulate cascades of responses from the adaptive immune system; this stimulation can help promote higher counts of leukocytes (common in innate response) that mediate infectious responses.\(^1,3,6\) Neutrophils and lymphocytes primary method of function is to eliminate invasive organisms from the system by phagocytosis and humoral/cellular immunity, respectfully.\(^6\) The study recorded mean total leukocyte counts (103/mL), mean neutrophil counts (103/mL), and mean lymphocyte counts (103/mL). Statistically significant evidence shows increase cell counts when comparing supplemented with *S. cerevisiae* and being infected with *T. brucei* groups and the non-supplemented group infected with *T. brucei*.
Figure 2 emphasizes on the Group III (supplemented/infected at .16mg/kg) and Group IV (non-supplemented/infected) to the difference between supplementing the probiotic *S. cerevisiae*. From day 28, time of infection, the body begins to see drop in cell counts, but the group of rats that were not in supplemented had the more detrimental count of leukocytes. Therefore, this demonstrates the ability of *S. cerevisiae* to stimulate immune response throughout the time of stress and infectious disease as indicated by the increased levels of leukocytes. It is important to note that between the black trend-line (Supp/inf .16mg/kg) and the red trend-line (No Supp/inf), lie both (Supp/inf .12mg/kg and Supp/inf .08mg/kg, respectfully from increasing to decreasing count).

PROBIOTIC AND THEIR THERAPEUTIC EFFECTS ON COLITIS

Illnesses associated with the term inflammatory bowel diseases (IBD) are used to relate to many dysfunctions of the intestinal gut. It is broad and covers many immune-related diseases with high rates of incidence to teenagers and young adults. Initial studies have assessed the effect of *S. boulardii* on Crohn’s disease or ulcerative colitis. Microbial antigen handling by DC is said to be of importance for immunity and tolerance in IBD. Thomas et al. aimed to illustrate the effects of the yeast probiotic *S. boulardii* on IBD. Purified LPS-stimulated CD1c+CD11c−CD123+ myeloid DC (mDC) from patients Crohn’s disease, with ulcerative colitis, or infectious controls were prepared in the laboratory in the presence or absence of fungal supernatant from *S. boulardii*. T helper cell phenotype and differentiation were both analyzed in a mixed lymphocyte reaction with allogeneic CD4+CD45RA− naive T cells from healthy donors. *S. boulardii* significantly decreased the frequency of CD40, CD80−, and CD197, a chemokine receptor-7-expressing IBD mDC, lowering the secretion of TNF-alpha and (IL)-6, and raising IL-8. Also in the mixed lymphocyte reaction, *S. boulardii* inhibited proliferation of pro-inflammatory T cells induced by IBD associated mDC. Furthermore, reduced expression of TH1 (TNF-alpha and INF-gamma) polarization induced by ulcerative colitis associated mDC and promoted anti-inflammatory IL-8; stimulating mucosal integrity. This study correlates to the previous study by Generoso, placing emphasis on the proliferation, differentiation of T helper cells that have various impacts on the intestinal epithelial cells and mucosal membrane. In the case of IBD, pro-inflammatory cytokines are stimulated due to excessive and uncontrolled proliferation of Th1, causing chronic inflammation resulting in damage to the cellular membrane.

Philippe et al., conducted research to see whether the probiotic Bifidobacterium lactis could potentially delay the onset of inflammation of colitis. In this specific study, the bacteria were supplemented into the water supply with approximately 3 X 10^9CFU/d per mouse. Donors and recipients were supplemented with either control solution or *B. lactis*. Results measured weight-loss of *B. lactis* supplemented recipients and control recipients of Cd4+ T cells. Control recipients began to lose weight after 9 days after adopting colitis. *B. lactis* recipients significantly delayed onset of weight loss until day 18, subsequently began to see detrimental effects of colitis (Fig. 3). *B. lactis* also significantly diminished expression of protein and phosphorylation of pro-inflammatory COX-2, IL-6, TNF-alpha, pp38/p38 markers in colon of recipient mice after transfer. The transfering of CD4+ T cells to recipient mice provided the researchers with a way to study the role that Tregs played in the suppression of inflammation, and identified the possibility to use probiotics (B. lactis) on RAR-/- (genetically deficient/immunodepressed) mice; definitively showing the preventive effects of B. lactis in the development of colitis (Table3).
**ANTIOXIDANT, FOOD TOLERANCE AND ALLERGIES**

Ongoing research is reviewing if probiotics strains could be useful for producing antioxidant enzymes which help neutralize free radicals. Free radicals are characterized by molecules unstable due to one or more lone pairs of electrons. The intestinal lumen is a powerhouse of free radicals because it is the site for heavy metabolic activity; therefore it is equipped with various enzymes such as superoxide dismutase, catalase, and glutathione peroxidase to rid the body of molecules such as singlet oxygen or peroxides. Molecules produced by some probiotics (no specific strain mentioned) are exopolysaccharides which could reduce oxidative stress in the intestines, but for the most part could function as various vitamins and minerals that quench antioxidants: activities relating to functions of vitamin E and vitamin C, or minerals such as iron, sulfur, or manganese released by the bacteria. Further research is yet to be conducted to provide more elaborate data to promote use of probiotics for antioxidant therapeutic benefits.

<table>
<thead>
<tr>
<th></th>
<th>COX-2</th>
<th>IL-6</th>
<th>TNF-α</th>
<th>pp38/pp38 (AU)</th>
<th>Mucosal Thickness</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>B. lactis</strong></td>
<td>Decreased*</td>
<td>Decreased*</td>
<td>Decreased*</td>
<td>Decreased*</td>
<td>Increased*</td>
</tr>
<tr>
<td><strong>Control</strong></td>
<td>Increased</td>
<td>Increased</td>
<td>Increased</td>
<td>Increased</td>
<td>Decreased</td>
</tr>
</tbody>
</table>

Table 3: Represents the 4 main pro-inflammatory components commonly seen in induction of colitis. As seen in the first row, *B. lactis* supplemented mice saw significant decreases in pro-inflammatory stimulation. On the other hand, mucosal thickness increased, therefore more protection to the intestinal wall; an inverse relationship is seen with the control group.8

Probiotics also function as tools for allergy prevention. In accordance to the microflora hypothesis, alterations to environment of intestinal lumen, more industrialized countries see altered mechanisms of mucosal immune tolerance. They play a role in immunocompetence and tolerance via mucosal immune system represented by GALT; being about 70 percent of lymphoid tissue. Adverse reactions or intolerances are, in part, due to lymphoid tissue which recognizes the foods as antigens and stimulates a response. The emphasis on probiotic consumption to help with food allergies is early development of tolerant cells in early stages. There is evidence suggesting oligosaccharides in breast milk lead to an increase in beneficial flora dominated by *Bifidobacteria*, directly impacting the composition of microbiota in children.

In conclusion, probiotics provide many therapeutic effects from development of the immune system to, more specifically, regulation of the adaptive immune system which regulates inflammatory activity. The benefits of probiotics include their protective effect against invasive pathogens from permeating the intestinal wall, promoting a systemic infection. With the use of probiotics, incidence of chronic inflammatory bowel disease could potentially diminish, or at least be delayed significantly. Because of their immunomodulating properties, probiotics may be useful in treating and preventing immune disorders as discussed: Allergy, chronic inflammation, and provide an overall improvement in the immune system. A recommendation for improving micro flora in the intestine is to ingest at least one probiotic supplement a day; there is a large commercial variety of probiotic products from yogurts, to powders, and capsules. By doing so, overall digestive health is sure to increase, and improve quality of life for those afflicted with disease.

**Figure 3:**

Figure 3: Diagram represents percentage of weight loss due to adopted CD4+ cells. *B. lactis* shows a delayed onset of weightloss as compared to the control counterpart. Http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3145352/

**References**

3. Chervonsky AV. Microbial influences on immune function and more. *Immunological Reviews*. 2012;245:7-12

(continued on next page)


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**The Respiratory System – Crossword Puzzle**

ACROSS

1. the membrane-lined cavity behind the nose and mouth, connecting them to the esophagus.

4. a pair of spongy, air-filled organs located on either side of the chest

6. are tiny sacs within our lungs that allow oxygen and carbon dioxide to move between the lungs and bloodstream

7. a flap of cartilage at the root of the tongue, which is depressed during swallowing to cover the opening of the windpipe.

8. a tube that connects the pharynx and larynx to the lungs

9. the opening in the lower part of the human face, surrounded by the lips, through which food is taken in and from which speech and other sounds are emitted.

DOWN

2. a large air filled space above and behind the rose in the middle of the face. Each cavity is the continuation of one of the two nostrils.

3. any of the minute branches into which a bronchus divides

5. the muscle that separates the chest (thoracic) cavity from the abdomen, the main muscle of respiration.

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**References cont.**


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**National American University’s Austin campus is seeking applications for adjunct faculty positions to teach Medical Laboratory courses, Anatomy & Physiology, and other Medical Assisting courses**

- Applicants must be able to teach 1-2 days/wk in the evenings
- 3-5 years teaching experience preferred
- Minimum qualifications include a bachelor’s degree in a related field (MD, PA, NP required to teach A&P)
- Certification and licenses must be current or able to reinstate (i.e., CMA, RMA, MT, RN)
- Applicants invited to interview will need to prepare a 15 minute teaching demonstration to a small panel of staff/faculty
- Textbooks and instructor resources provided.

Submit an employment application (http://www.national.edu/careers-nau), letter of interest, current resume, and a copy of your college transcripts to:

**Medical Assisting Program Coordinator**

13801 Burnet Rd., Ste. 300

Austin, TX 78727

Fax/Email resumes to (512) 651-4705 or vvera@national.edu

**EEO**

To apply:

**Spring/Summer 2017 / TxSSAMT The New Texan**
1. NAU celebrating Medical Assistant Week with a delicious cake and instructor Viviana Pelton
2. President Taffy Durfee presenting the President’s Award to Secretary Katrina Fryar
3. TxSSAMT Hall of Fame Members: Jim Kinney, Michelle Jenkins, Tommy McGonagill, Vernell Boyd, and Sibyl Allenson
4. Speaker Presentation
5. TJ Weatherly, Glenda Mathews reviewing the completed Treasurer’s audit report with Treasurer Jean Palmer
6. TJ Weatherly taking a moment to smile in his wizard costume
7. President Taffy Durfee presenting the Outstanding RMA Award to Treasurer Jean Palmer
8. Celia, Taffy and Kat having fun at the Halloween themed social
9. Vernell Boyd installing the new 2017-2018 TxSSAMT Officers: Katrina Fryar, Jean Palmer, Celia McDonald, TJ Weatherly
10. Vernell Boyd giving Sibyl Allenson a hug after receiving the Hall of Fame award; Sibyl was escorted by TJ Weatherly
11. Treasurer Jean Palmer and Convention Coordinator Michelle Hege being silly after a lecture.
12. First time Attendees
13. Vernell Boyd, Sibyl Allenson, Michelle Jenkins, Taffy Durfee, Jim Kinney, TJ Weatherly, Katrina Fryar enjoying time together
14. Spooky Social Decorations
15. Ron White and Yvonne Spade taking a moment during the presentations
16. Yvonne Spade, Sibyl Allenson, Vernell Boyd before the lecture
17. TJ Weatherly the Sandal thief
18. Jim Kinney explaining the history of the cookie filled Cookie Jar with TJ Weatherly at the auction
19. Celia McDonald poses with her son, James, during the auction
20. Medical Assistants Viviana Pelton, Diana, and Barbara Dazey celebrating MA Week with Cake
21. Hall of Fame members Sibyl Allenson, Tommy McGonagill, Jim Kinney, and Vernell Boyd
Middle East Respiratory Syndrome is a virus that has recently been identified on the Arabian Peninsula and has traveled to countries outside of the Middle Eastern region. The virus itself is referred to as MERS-CoV and the illness is called MERS. It has also been known as the “camel flu” or “Saudi Arabia’s SARS-like virus”. The virus is easily spread and has caused concern to health officials.

MERS-CoV is a lethal virus that is a single stranded, positive sense RNA beta-coronavirus which is very large, 28-32 kb. (1) Coronavirus are a large family of viruses which include the common cold and SARS. They have a high rate of mutation and recombination which allows them to cross species. It was first identified in Saudi Arabia in 2012 and later in London in 2012. The virus was a 100% match to Egyptian tomb bats and associated with the bat Tylonycteris. (2) The exact mode of transmission is unknown but camels seem to be the reservoir. Most human cases have been caused by human to human contact. Countries on the Arabian Peninsula which have confirmed cases include Bahrain, Iran, Jordan, Kuwait, Lebanon, Oman, Qatar, Saudi Arabia, United Arab Emirates and Yemen.

Symptoms of the disease include fever, cough, shortness of breath, gastrointestinal symptoms such as diarrhea, nausea, vomiting and complications including pneumonia, kidney failure, septic shock and multi-organ failure resulting in death. It is especially dangerous to those with pre-existing conditions such as diabetes, chronic lung disease, heart disease, kidney disease, cancer and those with weakened immune systems. Laboratory findings include leucopenia, a low lymphocyte count, high levels of creatinine, lactate dehydrogenase and liver enzymes. The mode of transmission is not fully understood but it is believed to be spread by respiratory secretions, coughing, and close contact, especially in health care systems. Only a small number of infected patients have had exposure to camels. Incubation is usually between 5-6 days but can be as long as 14 days. Many of the cases have been care givers of sick people. The spread of this virus is uncommon outside of the hospital setting. There is no vaccine so treatment is for supportive measures only. The U.S. National Institutes of Health is working on developing a vaccine to this disease. Neither antivirals, interferon nor corticosteroids are effective for the disease. The disease has a 65% mortality rate and about 3 to 4 out of every 10 patients reported with MERS have died. (3)

According to the World Health Organization, between September 2012 and December 6, 2016, there have been 1,905 lab confirmed cases of MERS-CoV in 27 countries with 677 deaths. The first reported case was in Saudi Arabia in 2012 and later that year a case was reported in Jordan. There were 23 cases in Saudi Arabia found in the
hemodialysis and intensive care units. The largest outbreak outside the Arabian Peninsula was in the Republic of South Korea in May of 2015. (4) There were 19 people who died from the outbreak with 184 confirmed cases of infection and 6,508 people quarantined.

Camels have been proven to be the reservoir for the virus so warnings have been issued in the Arabian Peninsula to avoid camel exposure whenever possible. People should avoid touching camels, avoid consuming raw camel meat and raw camel milk. As camel urine is considered a medicine for several illnesses in the Middle East, a warning has also been issued to avoid consuming raw camel urine for medicinal purposes. Camels which have this virus only exhibit mild rhinitis but not the systemic disease. According to a study conducted in Oman, 100% of the Dromedary camels tested were positive for the anti-MERS-CoV antibodies. The infection could have been present for many years but not detected. Dromedary camels from Saudi Arabia and the United Arab Emirates also showed positive for the antibodies. Camels were commonly imported from Africa and when tested, camels from East, West and North Africa were also positive for MERS-CoV as early as 1992. (5)

In the United States, the first diagnosed case was a healthcare worker at the Community Hospital in Munster, Indiana in 2014.(6) The patient had been to Saudi Arabia a week earlier. The second positive case in the United States was a patient who had also traveled to Saudi Arabia and returned to Orlando, Florida in 2014. A third case was a man from Illinois who was a business associate of the first case patient. He had met with the Indiana health care worker and shook hands with the man.

The Centers for Disease Control (CDC) has begun to monitor the incidence of the disease. As of July 31, 2014, the CDC many detain individuals who are believed to have a quarantinable disease, including MERS, as per the amended U.S. Executive Order #13295. They also have provided guidelines in the United States for flight crews, Emergency Medical Services (EMS) units at airports, and for US Customs and Border Protection Officers about reporting ill travelers.

Most cases of MERS have been acquired from people who care for those already ill with the disease. With health care workers being at an increased risk, guidelines have been established for those in close contact with possible positive MERS patients. A N95 filtering face piece respirator should be used along with eye protection, long sleeved gowns, gloves and hand hygiene performed before and after donning gloves. The patient should be placed in a negative pressure room. Recommendations for the patient’s room should include droplet precautions and contact precautions along with personal protection equipment.

The CDC recommends testing of possible cases by two ways:
1. Polymerase chain reaction, conducted by state and CDC labs done with respiratory, serum, or stool samples
2. Serology testing using serum to look for antibodies to MERS-CoV by 3 separate tests:
   a. Screening test enzyme-linked immunosorbent assay-ELISA
   b. Confirmatory test called IFA, immunofluorescent assay
   c. Neutralizing antibody assay, which is a slower test but more definite

Specimens should be submitted from ALL of 3 different types; lower respiratory, upper respiratory and serum. The lower respiratory can be either a bronchoalveolar lavage, tracheal aspirate, or pleural fluid. Roughly 2-3 mL of the specimen should be collected and placed into a sterile dry container. The upper respiratory should be from a nasopharyngeal swab and oropharyngeal swab, but only use a synthetic fiber swab with plastic shafts. Calcium alginate swabs and wooden shaft swabs should not be used as they may inhibit the PCR testing and inactivate the virus. Serum for detection of the virus, not the antibodies, uses the rRT-PCR procedure and is optimal during the first 10-12 days after the symptoms begin. Shipping of the specimens should be according to the current edition of the International Air Transport Association (IATA) Dangerous Goods Regulations which suggests refrigeration of the specimens up to 72 hours and ship on dry ice. For information on general guidelines of specimen collection and shipping, contact the Centers of Disease Control.

References
The kidney is a complex organ that filters toxins from the blood stream, aids in equilibrating essential minerals, electrolytes and hormones in the body and can have a variety of disease processes. These diseases disrupt the normal kidney anatomy and function causing pain and discomfort to the patient. With the collaborative effort of the clinical lab, anatomic pathology, physicians and their support staff, most of these abnormalities can be discovered and investigated quickly to help in a patient’s speedy recovery.

As a major component of the genitourinary system and homeostasis maintenance, the kidney is composed of many small complex filtering units that remove toxins and reabsorb electrolytes from the blood. Metabolism end products that the body cannot get rid of via respiration are excreted through the kidneys as urine. Most people have two bean shaped kidneys located on either side of the cerebral spinal column that are about the size of a fist. Ureters connect the kidneys to the bladder and act like a tube system for urine export. Blood enters the kidneys from the arteries and is dispersed among the glomeruli whose semi permeable membrane allows smaller electrolytes (potassium, calcium, sodium, chloride, glucose, blood urea nitrogen, creatinine, and carbon dioxide) and water soluble waste products into the filtering system. Protein is left in the blood circulation system. The blood components are then circulated (partially reabsorbed) through the proximal convoluted tubules, the loop of henle and then the distal convoluted tubule before it exits the nephron as urine. The normal weight of a kidney can range from 125-170grams in males and 115-155 grams in females. In addition to filtering the blood, the kidney functions as a part of the endocrine system by creating erythropoietin, rennin and calcitrol. Erythropoietin is involved in red blood cell production, rennin regulates blood pressure, and calcitrol plays a part in bone formation.

Horseshoe kidney and polycystic disease are two rare kidney abnormalities that patients develop causing pyelonephritis, urinary tract infections and kidney stones. The horseshoe shaped kidney disease is a congenital disorder where the kidneys are fused at the lower pole. As a result, the urine and toxins can pool at the base instead of exiting through the ureter to the bladder. The patients can lead a normal life, but should be aware that urinary tracts infections are frequent due to the urine pooling. Edward’s Syndrome (Trisomy 18) and Turner’s syndrome (Monosomy X) are usually the common causes for the horseshoe kidney abnormality affecting 1 in 400 people. Polycystic disease is characterized by the growth of numerous cysts within the kidney. The cysts form from dilated filtering ducts and collecting tubules within the nephrons. The normal shape is altered giving it a multilobular appearance while deteriorating the microscopic structure. Due to the pooling of urine filtrates, aggregates form creating kidney stones and pyelonephritis. After time, the kidneys will fail (renal failure)and then dialysis or removal of the infected organ will be necessary. Interpretation of lab tests such as urinalysis, serum creatinine and urea nitrogen aid in diagnosing the abnormalities.
normal parenchyma (microscopic structure) as it travels through the urinary tract. The stones will either pass causing patient discomfort, it is surgically broken up into smaller pieces and allowed to pass, or the kidney is removed in the most extreme cases.

Renal cell carcinomas can be seen in many different forms and usually starts in the cortex. Clear cell carcinoma is the most common type of Renal Cell Carcinoma that is usually found in the upper pole. Blood accumulation and cellular breakdown of necrosis contributes to the red and golden yellow discoloration. This type of cancer is seen breaking through the renal capsule into the surrounding perinephric fat. Papillary cell carcinoma is well circumscribed with a white-tan appearance. It is soft and mushy similar to curdled milk or cottage cheese. Chromophobe cell carcinoma is also well circumscribed with a firm tan-brown appearance. The cancer seen microscopically is void of all the normal architecture. Lastly, Transitional cell Carcinoma is generally found in the transitional cells lining the bladder, ureter and renal pelvis.

Patient care is best served with the collaboration of the physician and different laboratory departments. Abbott laboratories coined the phrase “Labs are vital” and it couldn’t be a better slogan. Urine cultures setup in microbiology aid in identifying bacterial infection and the proper course of antibiotics. Chemistry tests can check for electrolyte balance and kidney filtering capabilities. Urinalysis and microscopic evaluation of the sediment can detect sudden kidney damage or a slow disease process. Anatomic pathology, histology and cytology work together to determine malignancy and how advanced it develops. With the knowledge of laboratory results, the clinician can better understand and treat the symptomatic patient.

References
PROBIOTICS
CE #31-301-17 - (1.5 CE)

1. Which bacteria are often considered probiotic?
   a. Enterobacteria
   b. Chlamydia
   c. Lactobacillus
   d. Staphylococcus

2. Which is NOT part of the innate immune system?
   a. Natural Killer (NK) Cells
   b. Myelin Sheath
   c. Neutrophils
   d. Macrophages

3. Interleukins are____.
   a. Cytokines that stimulate cell-mediated and humoral immunity
   b. Gut-Associated Lymphoid Tissues
   c. Short chain fatty acids
   d. Probiotic Bacteria

4. According to the study by West et al., Infants older than _____ Months who consumed the probiotic L. paracasei maintained a stronger Th cell response.
   a. 3
   b. 6
   c. 9
   d. 12

5. _____ are living microorganisms which provide a health benefit.
   a. Pathogens
   b. GALT
   c. Opportunistic organisms
   d. Probiotics

6. Generoso et al concluded viable (live) probiotics resulted in_____ Bacterial Translocation (BT).
   a. more
   b. less
   c. about the same
   d. no

7. Neutrophils’ and Lymphocytes’ primary method of function is____.
   a. Provide blood volume
   b. Eliminate invasive organisms
   c. Produce probiotics
   d. Eliminate metabolic waste

8. In the study by Philippe et al, B. lactis probiotic supplement showed preventative effects by delaying____.
   a. Time to produce antibody
   b. Crohn’s disease
   c. Development of colitis
   d. Death

9. The intestinal lumen is a “powerhouse of free radicals” because____?
   a. Is the site for heavy metabolic activity
   b. It is really bright inside
   c. Contains acid
   d. Of peristaltic activity

10. What is not a potential benefit of probiotic use?
    a. Protective effect against invasive pathogens
    b. Potentially can diminish chronic IBD
    c. Lose weight without working out
    d. Treating allergies

MIDDLE EAST RESPIRATORY SYNDROME
CE #31-302-17 - (0.5 CE)

1. What type of organism is MERS-CoV?
   a. bacteria
   b. virus
   c. parasite
   d. fungal

2. What is the current reservoir for MERS?
   a. Bats
   b. Camels
   c. Humans
   d. Dogs

3. What is the current mortality rate for MERS?
   a. 25%
   b. 55%
   c. 65%
   d. 75%

4. Where has the largest outbreak of MERS been outside of the Arabian Peninsula?
   a. South Korea
   b. United States
   c. Philippines
   d. United Kingdom

5. What is the drug of choice for a MERS infection?
   a. Antivirals
   b. Corticosteroids
   c. Interferon
   d. There is no drug of choice

6. What are common laboratory results obtained from a patient with MERS?
   a. Leukopenia and high lymph count
   b. Leukocytosis and low lymph count
   c. Low levels of creatinine and liver enzymes
   d. Elevated amylase and lipase

7. Which type of testing is NOT used on MERS by the CDC?
   a. PCR
   b. ELISA
   c. IFA
   d. Culture

8. In what country was MERS first identified?
   a. Jordan
   b. Iran
   c. Saudi Arabia
   d. Iran

9. What type of precautions should be taken with a suspected MERS patient in a health care facility?
   a. Contact precautions
   b. Droplet precautions
   c. Negative pressure room
   d. All are recommended

10. How many countries have lab confirmed cases of MERS-CoV?
    a. 10
    b. 21
    c. 25
    d. 27

Please do not send money, these are free CEUs.
Send a copy of your answers, CE# and the identification form below to:
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American Medical Technologists Institute for Education Reporting form for Continuing Education Hours
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Last Name: ____________________________________________
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Check AMT Certification:
☐ MT ☐ MLT ☐ COLT ☐ RPT ☐ RMA ☐ RDA ☐ CLC ☐ CAHI
AMT I.D. Number ______________________________________
(Do not put social security number on form)
1. What connects the kidneys to the bladder?
   a. urethra
   b. ureter
   c. renal pelvis
   d. cystic duct

2. In addition to filtering the blood, what are other kidney functions?
   a. regulates blood pressure
   b. helps in bone formation
   c. creates erythropoietin
   d. all the above

3. Formation of a horseshoe kidney is what type of disorder?
   a. malignant
   b. hereditary
   c. congenital
   d. diagnostic

4. What characterizes Polycystic Disease?
   (circle all that apply)
   a. multilobular appearance
   b. deteriorated microscopic structure
   c. numerous cysts
   d. all the above

5. What is an example of a glomerular disease?
   a. tubular
   b. interstitial
   c. minimal change
   d. necrosis

6. Ischemic acute tubular necrosis is caused by what type of kidney disease?
   a. glomerular
   b. tubular
   c. interstitial
   d. vascular

7. What color characterizes Chromophobe cell carcinoma?
   a. white and soft
   b. red and golden yellow
   c. tan and brown
   d. green and yellow

8. Urine cultures are best used to find what diagnostic result?
   a. identifying which bacteria is causing the infection
   b. identifying the presence of a kidney stone
   c. identifying urine sediment
   d. determining glucose levels

9. Transitional cell carcinoma is found in what part of the kidney?
   a. renal cortex
   b. ureter
   c. lower pole
   d. upper pole

10. Why does kidney stones turn urine dark red?
    a. growth of cancer in the upper pole
    b. due to pyelonephritis
    c. destroys the normal paranchema
    d. the stone is too big to pass

### Calendar of Events

**MEETINGS OR CONVENTIONS**

**APRIL 24-28, 2017**
Medical Laboratory Professionals Week

**APRIL 28-29, 2017**
TxSSAMT 2017 Spring Meeting and Conference

**JULY 9-13, 2017**
79th Educational Program and National Meeting

**FALL 2017**
TxSSAMT 2017 Fall Meeting and Conference
(information coming soon)

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**A New Way to Track Your Continuing Education!**

AMTrax is AMT’s newest online CE tracking system. Simply log in as a member on the AMT website (www.americanmedtech.org) and click on AMTrax under the Continuing Education tab.

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- One easy and convenient place to track your CE and related activities
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- Print your record anytime for your employer or state licensing agency
- Easy way to demonstrate CCP compliance (for those certified after 1/1/06)
- Passing scores on AMT online CE tests, like STEP Online, automatically populate AMTrax
- It’s FREE!

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**The Respiratory System - Crossword Key**

<table>
<thead>
<tr>
<th>pharynx</th>
<th>trachea</th>
</tr>
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<tr>
<td>lungs</td>
<td>epiglottis</td>
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<tr>
<td>diaphragm</td>
<td>trachea</td>
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<tr>
<td>mouth</td>
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Spring/Summer 2017 / TxSSAMT
In aromatherapy, essential oils are used for therapeutic and healing techniques. They are made from the various aspects of known healing plants that include leaves, resin, stems or roots. Frankincense oil is made from hardened resin drops of a Somalian tree called Boswellia carterii or Boswellia sacara. The resin tear shaped drops are collected and then steam purified. Here are some uses of the frankincense essential oil.

• By adding a few drops of the essential oil to a hot bath, the vapors will create a fragrance that will encourage relaxation and peace. Used in a diffuser, it can promote stress relief and encourage even breathing and relaxing sleep. When inhaled, it’s been shown to reduce heart rate and high blood pressure. It does not cause drowsiness.

• Frankincense essential oil is a natural antiseptic antibacterial and natural deodorizer. It is helpful as a household cleaner and can be used for oral care to prevent bad breath and tooth decay. It can be used as an astringent to protect skin cells by reducing acne and decreasing large pores. It tightens skin by improve its elasticity, tone and appearance as someone ages.

• The essential oil also acts as an anti-inflammatory in the nasal passages, making breathing easier, even for those with allergies or asthma. It is also used to provide relief from coughing.

• By adding a few drops to water, Frankincense essential oil helps relieve gastrointestinal discomfort by speeding the secretion of digestive enzymes. The oil relaxed the muscles of the digestive tract and also helps improve circulation, which is needed for proper digestive health.

Research information gathered from draxe.com, witchipedia.com and mercola.com.

Our state is in need of a NEW PIN!! So we are offering a pin design COMPETITION! A TxSSAMT member can design a state pin and email their work to TxSSAMT President, Katrina Fryar. The designs will be voted on by the board and the winner is awarded a lifetime of FREE conference registrations.

The winner will be announced at the Fall 2017 Conference. So HAVE FUN and let the imaginations flourish!! Can’t wait to see what you think represents our great state!

CALLING ALL TxSSAMT MEMBERS!

Are you tired of traveling for conferences? Would you like to host a conference in your area?

We would love to explore new areas of Texas, but need an individual to be our local contact person. Hosts/Hostesses would need to obtain local qualified speakers from the area that could lecture on laboratory and clinical topics. The TxSSAMT Conference Chair will help contract the hotel, conference center, snacks/meals, social and scholarship raising auction. TxSSAMT Board will help organize the written schedule, post to the website and notify members.

Please talk to any board member listed in the journal or snag one of us at the meetings! We would love to hear from you!
### FRIDAY, APRIL 28TH, 2017

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<thead>
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<tbody>
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<td>7:00-4:00pm</td>
<td>Meeting registration/Sign-in</td>
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<tr>
<td>7:50-8:00am</td>
<td>Welcome/Announcements- Katrina Fryar, MT (AMT), President</td>
</tr>
<tr>
<td>8:00-9:00am</td>
<td>“Procalcitonin (PCT) Use in Sepsis Management and Antibiotics Decisions”</td>
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<td>31-101-17</td>
<td>Ursula Klause, PhD, Roche Diagnostics, Sr. scientific Affairs Manager</td>
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<tr>
<td>9:00-10:00am</td>
<td>“Clinical Utility of Immature Cell Indices: Beyond the Routine CBC”</td>
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<td>31-102-17</td>
<td>Jason Anderson, Field Product Marketing Specialist - Sysmex</td>
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<tr>
<td>10:00-11:00am</td>
<td>“Working with Patients with Special Needs.”</td>
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<tr>
<td>31-103-17</td>
<td>Kathryn Davitt, CCLS-Cooks Children’s Hospital</td>
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<tr>
<td>11:00-12:00pm</td>
<td>“Supporting Children During Medical Encounters”</td>
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<td>31-104-17</td>
<td>Shannon Dier and Whitney Brosey, Cooks Children’s Hospital</td>
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<tr>
<td>12:00-1:00pm</td>
<td>Lunch on your Own/TxSSAMT Board Meeting</td>
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<tr>
<td>1:00-2:00pm</td>
<td>“Diabetes: Helping your Patients with Diabetes”</td>
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<td>31-105-17</td>
<td>Joyce M. Harrell, RD, LD, CDE - THR HEB Hospital</td>
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<tr>
<td>2:00-3:00pm</td>
<td>“State of the Art Dentistry: Implants, restorations and crowns in a day”</td>
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<tr>
<td>31-106-17</td>
<td>Dr. Ray D. Snider, DDS- Lake Country Dentistry</td>
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<tr>
<td>3:00-4:00pm</td>
<td>“Breast Cancer Support”</td>
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<td>31-107-17</td>
<td>Vanessa Pierce, RN, BSN, CBPN-IC : Certified Breast Patient Navigator</td>
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<td>THR Harris Southwest Hospital</td>
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<tr>
<td>4:00-5:00pm</td>
<td>“Breast Cancer: What You Need To Know”</td>
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<td>31-108-17</td>
<td>Tricia Trammell, CRA, R. T. (R) (M) (QM), CN-BI</td>
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<td>THR Harris Southwest Hospital</td>
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<tr>
<td>6:30-9:00pm</td>
<td>Dinner TxSSAMT World Famous Auction (included with paid registration)</td>
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### SATURDAY, APRIL 29TH, 2017

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</tr>
<tr>
<td>8:00-9:00am</td>
<td>“CNA- What does it stand for?”</td>
</tr>
<tr>
<td>31-109-17</td>
<td>Haley Papan, PCT-KCI</td>
</tr>
<tr>
<td>9:00-10:00am</td>
<td>“Evaluation of Cord Blood related to Hemolytic Disease of a Newborn”</td>
</tr>
<tr>
<td>31-110-17</td>
<td>Virginia Reyes, MT (AMT) Carter Blood Care</td>
</tr>
<tr>
<td>10:00-11:00am</td>
<td>“Spiritual Healing”</td>
</tr>
<tr>
<td>31-111-17</td>
<td>Mary Ellen Johnson, Chaplain, THR Harris Southwest Hospital</td>
</tr>
<tr>
<td>11:00-01:00pm</td>
<td>TxSSAMT Semi Annual Business Meeting- All members are encouraged to attend and lunch is provided.</td>
</tr>
<tr>
<td>1:00-2:00pm</td>
<td>“Biomarker Testing in Advanced NSCLC: Putting Guidance into Practice”</td>
</tr>
<tr>
<td>31-112-17</td>
<td>Heidi Arceneaux, Genentech</td>
</tr>
<tr>
<td>2:00-3:00pm</td>
<td>“Pipetting: the proper method towards achieving Precision and Accuracy”</td>
</tr>
<tr>
<td>31-113-17</td>
<td>Ronald White, MLS-AMT, MLS Lead Harris Southwest Hospital</td>
</tr>
<tr>
<td>3:00-4:00pm</td>
<td>“C. Diff: All about the bug”</td>
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<tr>
<td>31-114-17</td>
<td>Ronald White, MLS-AMT, MLS Lead Harris Southwest Hospital</td>
</tr>
<tr>
<td>4:00-5:00pm</td>
<td>“Attitude in the Work Place”</td>
</tr>
<tr>
<td>31-115-17</td>
<td>Michael Crockett, MT (ASCP) Texas Health Southwest Hospital</td>
</tr>
</tbody>
</table>

Schedule is subject to change.
Pre-Registration Form

Name: __________________________________________________________

Check One:  q MT  q MLT  q RMA  q RDA  q RPT  q CLC  q AHI  q CMAS  q CMLA
Check One:  q AMT  q ASCP  q ASCLS  q OTHER

Address: ____________________________________________________________________________

City: ____________________________________________________________ State: ___________ Zip: ______________

AMT ID# ______________________ Phone: ___________________________

<table>
<thead>
<tr>
<th>General Registration:</th>
<th>(All Seminars) Friday &amp; Saturday</th>
<th>(One Day Only) Friday or Saturday</th>
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<tr>
<td>AMT Members</td>
<td>$75.00 ($85.00 at door)</td>
<td>$40.00 ($50.00 at door)</td>
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<tr>
<td>Non AMT Members</td>
<td>$90.00 ($100.00 at door)</td>
<td>$50.00 ($60.00 at door)</td>
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<tr>
<td>Military Personnel</td>
<td>$20.00 ($25.00 at door)</td>
<td>$10.00 ($15.00 at door)</td>
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<tr>
<td>Students with ID</td>
<td>$10.00 ($10.00 at door)</td>
<td>$10.00 ($10.00 at door)</td>
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</tbody>
</table>

Registration Total $ ___________

☐ RSVP if you are attending the Friday night social. No. Attending _____

Make checks payable to TxSSAMT and send registration to:

Michelle Hege • 979-574-0350 • txssamt@gmail.com
5404 Trailview Drive • Temple, Texas 76502

(NO T E: Your receipt will be in your registration packet. No confirmations will be mailed.)

Courtyard Fort Worth at Alliance Town Center Reservation

3001 Amador Drive
Fort Worth, TX 76177


(817) 753-6100

Hotel rate is $119/per night plus tax (King or double)

(TxSSAMT is not responsible for your personal reservation.)
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<tr>
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