

全自动血型仪ABO血型检测可靠性探讨

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随着血型检测技术的发展, 全自动微板血型检测系统具有快速、准确、自动化程度高等优点, 改变了传统的手工操作, 提高了血型检测自动化程度。我站于2011年引进瑞士HAMILTON公司生产的全自动血型分析仪STAR BG用于血型检测。现将检测情况报道如下:

2028例各类生物检材的STR检验成功率见表1。总STR检测成功率为90.8%, 其中成功率最高的为口腔拭子、软骨及组织, 几乎100%; 其次是血痕、混合斑、烟蒂、口香糖; 接触性DNA的成功率则较低。

表1 STAR BG全自动血型仪检测统计情况

仪器	检测量(例)	一次判读可定型数量(例)	判读“?”量(例)	判读定型结果定量准确数(例)	判读率(%)	准确率(%)
STAR BG	22342	22158	184	22158	99.18	100%

表2 STAR BG全自动血型仪判读184份不可定型结果原因分析

原因分析	例数(n)	现象
标本抗凝问题	53	肉眼见凝块存在, 图像见微孔标本红细胞漏加
脂血	15	肉眼试管有脂血现象, 图像见微孔中凝集块被脂血覆盖
溶血	7	肉眼试管有溶血, 图像见溶血
红细胞试剂抗原效价降低	35	图像见反定型颜色偏红或血型判为“?”增多, 更换试剂正常
微板不洁净	49	图像见微板不洁净, 凝集块散在, 不能很好地居中
ABO亚型	1	图像正反不符合, 经确认为A2B
ABO以外不规则抗体	2	图像有微孔呈弱凝集态, 经确认为不规则抗体阳性
ABO弱抗体	24	图像有微孔呈弱凝集态, 经试管法确认为1+

目前, 输血医学实验室最常用的ABO血型的鉴定方法是血凝实验和微柱凝胶试验(MGT), 血凝试验是指抗体和红细胞在液体介质中发生肉眼可见的凝集反应, 根据操作方法的不同, 主要分为3种方法即玻片法、试管法和全自动微板法。玻片法操作简便、节省材料、价格低廉, 但在实际工作中常因过度频繁的反复操作而出现差错。试管离心法虽然结果较准确, 但操作繁琐费时, 易出现人为差错。微柱凝胶法虽然方法学先进, 操作简单, 所需样本量少, 程序自动化, 结果明确可靠, 但成本高, 价格昂贵。微板法检测ABO、Rh(D)血型改变了传统的手工操作, 消除了许多人为因素的影响, 具有快速、自动化程度高等优点。玻ABO血型鉴定要求100%准确定型, 这关系到输血患者的生命安全, 是血站检验工作的主要组成部分。表1显示, STAR BG全自动血型仪一次判读定型率为99.18%, 高于相关文献报道98.5%, 准确率为100%, 满足ABO血型的鉴定要求, 适合血站对献血员进行血型检测。

全自动血型分析仪STAR BG通过其特有的涡旋孵育离心振荡技术和六次成像技术, 改变了传统的手工操作、肉眼判读结果的检测方法, 提高了工作效率, 降低了人为因素对实验造成的影响, 凝集图像直观, 结果可靠, 方便人工核对。但如果ABO判读不可定型或凝集图像显示弱凝集时, 应该用经典的常规方法确认, 以考虑是否有亚型、弱抗体和假凝集等因素存在。鉴于血型的复杂性, 以及表2结果显示血型检测判读定型的影响因素众多, 故在血型检测中还应该加强质量管理和检测前、检测中和检测后的过程控制。

世界首现“突变AB型”血B型父母生出AB型子女

父母都是B血型, 但生出的子女却是AB型。这是世界上首次发现“突变AB型(Cis-AB09)”血型!



从遗传学角度来看:
父母都是A型, 子女可能是A型或O型
父母都是B型, 子女可能是B型或O型
通常达到普通人的10%—15%的普通AB型, 大部分是从父母一方获得A血型遗传基因, 从另一方获得B血型基因。

血型遗传表

一方血型	另外一方血型	孩子可能的血型	孩子不可能的血型
A	A	A,O	B,AB
B	B	B,O	A,AB
A	B	A,B,O,AB	
AB	A	A,B,AB	O
AB	B	A,B,AB	O
O	A	O,A	B,AB
O	B	O,B	A,AB
O	AB	A,B	O,AB
AB	AB	A,B,AB	O
O	O	O	A,B,AB

据韩国《东亚日报》网站10月22日报道, 三星首尔医院赵德教授表示, “在国际血库上出现Cis-AB09血型尚属首次。”首个被判定为Cis-AB09血型的人是一名29岁的女性, 研究组在她为了卵巢囊肿手术而进行血液检查的过程中发现了这一事实。

此次发现的Cis-AB09血型, 即使在Cis-AB血型中也是很罕见的情况。这是一种没有从父母那里得到遗传基因的突变。赵教授解释称, “与引起遗传基因突变的祖上一代不同的新的遗传基因诞生。”

这种Cis-AB09血型无法从现有AB型身上接受输血, 只能从O型人身上接受输血。研究组说, “碰到像这样稀有血型的情况, 平时最好储存起自己的血液。”



澳斯邦::参展第67届美国AABB博览会【回顾】

转眼间, 美国血库协会(American Association of Blood Banks)2015年年会在被誉为全美度假胜地之一、迪士尼公园的故乡安纳海姆市盛大闭幕, 作为全球最大规模的输血行业博览会, AABB成员包括近2000家机构和8000名个人, 包括医生、护士、科学家、研究人员、管理人员、医疗技术人员和其他卫生保健提供者。议员均位于80多个国家。澳斯邦公司作为其中一员, 誓为国际输血事业做出贡献。

在美丽的美国的度假胜地, 加州安纳海姆世界会议中心内, 澳斯邦再次展示了具有独特工业设计美感的自主产品AusWasher(垂直离心洗板机, 残留量0.01ul), 颠覆了传统血型检测技术的AusCATor(在线柱凝集血型分析系统), 独创的3卡式垂直离心机、独一无二的14孔AusCATcard、创新的在线混匀技术AusMixer以及先进的辐照式孵育模块等等领先技术闪亮登场, 同样, 我们的AusELISAor(384全自动酶免分析系统)运用自动化技术, 吸引着众多国内外业界知名人士的目光, 越来越多的专家学者将赞许的目光投入到我们的身上。

澳斯邦::参展德国MEDICA国际会议【回顾】

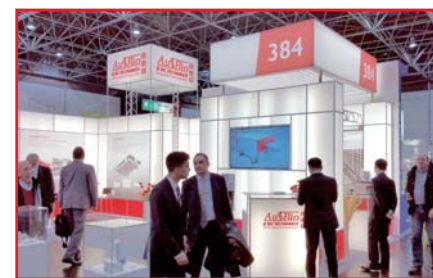
2015年11月16—19日, 蒙蒙细雨中, 第四十七届世界医疗论坛国际展览会及会议/第二十四届国际医疗制造业配件、零件及原材料展览会(Medica/Compamed 2015)在德国杜塞尔多夫会展中心内举行。张太玉、岳金鑫初出茅庐, 第一次出国参展, 收获颇丰。

AusWasherMTP是本次展览会主要展览产品之一, AusWasherMTP的出现对于业界人士来说是一种福音, AusWasherMTP自动离心(垂直离心)洗板机解决了传统洗板机难以解决的洗板问题。AusWasherMTP外形比较像酶标仪, 很多参展人士问我们It's a reader? "No, it is a washer! Automated washing by centrifugation!"很自豪地告诉他们。

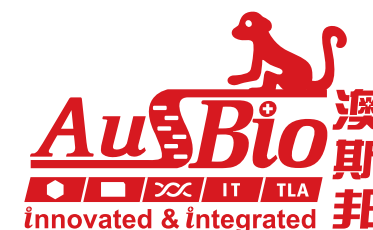
由物料存储运输管理单元(AusLogor)、样本分析前处理单元(AusPAS)、液体处理单元和多功能单元(Multifunction unit)组成, 可以将常规的生化、酶免、血型、核酸等项目检测一站式完成的临床实验室绝对自动化系统-AusALA同样是吸引了世界各地参观者的驻足。



澳斯邦::参展第67届美国AABB博览会



澳斯邦::参展德国MEDICA国际会议



生理学和免疫病理学中的免疫细胞—血小板

Editorial: Platelets as immune cells in physiology and immunopathology

关键词: 血小板, 炎症, 感染, 输血, 免疫

Keywords: platelets, inflammation, infection, transfusion, immunity

Blood platelets are essential for the earliest stages of coagulation, namely, primary hemostasis. They adhere to damaged vessel endothelium, stick to each other (aggregate), and form clots; this prevents bleeding. For most physicians, those attributes of platelets are exactly what they learned in medical school years ago, and this basic knowledge seems quite enough to allow a valid therapeutic strategy when numbers or hemostatic functions of platelets are aberrant. In some cases, this consists in prescribing anti-platelet drugs (aspirin or more sophisticated drugs) to prevent overly active clotting in cardiovascular and metabolic dysfunctions. In other instances, this consists in prescribing platelet transfusions when the platelet count is dangerously low (or - in exceptional occasions - when platelets are dysfunctional). It could be as simple as that, but in fact, it is often not, because platelets are more versatile than initially thought (or expected) and some modification is needed in many cases¹. To cite only one example, anti-viral treatment of HIV infection causes atheroma and platelet deposition, emphasizing the recently recognized inflammatory function of platelets^{2,3}; anti-platelet therapy seems a likely approach, but this is not current practice yet.

众所周知, 血液血小板在凝血发生最初阶段, 也称原始止血, 是必需的物质。它们黏附在血管损伤内皮处, 互相聚集(凝集)形成凝块, 防止出血。对大多从医人士来说, 血小板的这些特性和医学院里所学到的一模一样; 当血小板计数或凝血功能异常时, 有这个基本知识就足够制定有效的治疗方案了。有些病例需要医生给病人开抗血小板的药物(如阿司匹林或更复杂的药方), 以防止心血管和代谢功能障碍患者的过度活跃凝集; 另外一些病例则需要血小板计数极低(或当血小板功能失调时)给病人输注血小板。

然而事情并非这么简单, 其实血小板的用途比预期更多, 因此在很多病例中都需要改进¹。仅举一个例子来强调近期认识到的血小板促炎功能^{2,3}, 如在HIV抗病毒治疗时导致的动脉粥样化和血小板沉积; 采用抗血小板疗法似乎是个可行的方法, 但还没有列入现在常规处理。

Thus, let us imagine that a scientific magazine writer decides to contribute a paper emphasizing novel advances in platelet research; the journal's instructions are: no more than four key points, a concise style, and only issues that can be understood by a large community; and - icing on the cake - a translation into today's or tomorrow's therapeutics. What would he/she insist on?

因此, 让我们想象一下, 一名科学杂志作者决定投稿一篇主题为“血小板研究新进展”文章时; 杂志社给出的指令是: 不能超过四个关键点, 要简约风格, 文章要能被广大读者理解; 而且要锦上添花—成为现在和未来治疗的转化医学。问这名作者该坚持哪几点呢?

The proposed four points, which in our opinion, are either really new or newly rediscovered (after having been buried for decades and perhaps completely forgotten) would be:

-Not only are platelets genuine cells but also are they intelligent cells, as they can sense dangers differentially^{4,5}.

-Despite platelets have been suspected to be inflammatory cells as soon as in the early 70s', this opinion either has been ignored or faded⁶. Platelets indeed participate in innate immunity and they can influence adaptive immunity⁷⁻⁹; they are "licensed" as highly potent pro-inflammatory cells¹⁰.

-Platelets have a remarkable ability to sense and bind microbial agents, in particular, pathogenic viruses, and foremost bacteria^{11,12}; interestingly enough, this property has been recognized in the early 70s'¹³ but not exploited since recently¹⁴.

-Platelets have more than one cell partner (the endothelial cell) as they intimately interact with the leukocyte, not only at different phases of the clot formation but also in tissue pathology^{15,16}; this is also an issue, which is rediscovered after having been under-acknowledged according to its importance¹⁷.

我们认为, 值得推荐的四个观点应该是的确真新, 或是重新被发现的(被埋没几十年后):

-血小板不仅是名副其实的细胞, 而且是智慧细胞, 因为它们能察觉出不同的危险^{4,5}。

-尽管早在70年代初血小板就曾被怀疑是炎症细胞, 但这个观点不是被忽略就是被遗忘了⁶。血小板的确参与原发免疫, 并且可以影响继发免疫⁷⁻⁹; 他们被“授权”成为能力巨大的促炎细胞¹⁰。

-血小板具有超凡的能力去感知并结合微生物体, 尤其针对致病性病毒和重要细菌^{11,12}; 搞笑的是这个特性在70年代初就被发现了¹³, 但直到最近才被开掘出来¹⁴。

-血小板有不止一个细胞伙伴(内皮细胞), 因为他们与白细胞进行密切互动, 不仅在血栓形成的各个阶段, 而且组织病理活动中^{15,16}; 这也是个极重要的问题, 而且是被埋没许久而再次被发现的¹⁷。

Why are all four key points really interesting for the medical community, and beyond to the patient community? Concisely, we suggest three reasons:

为什么医学界应该对上述四个关键点给予重视, 甚至说为什么病患群体也应该关注?

我们简要地提出三个原因:

作者: Olivier Garraud
Garraud O (2015). Front. Immunol. 6:274. doi: 10.3389/fimmu.2015.00274

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-First, these findings lead to revisiting the essential functions of platelets. While platelets were principally considered relevant to vascular pathology (vessel injury and bleeding), today they are also considered as sentinels along the vascular tree, detecting insults and making daily repairs. Importantly, platelets perform an immune function as danger sensors, detecting viruses and bacteria.

-第一, 这些发现引导我们重新审视血小板的基本功能。尽管血小板主要被认为与血管病理学相关(血管损伤和出血), 而如今它们更被认定为沿着血管树驻扎的卫兵, 检测袭击并进行日常修复。尤为重要的是, 血小板执行一种免疫功能如同危险感应器, 检测流通的病毒和细菌。

-Second, because they are non-nucleated, and mere fragments of the megakaryocyte, platelets were thought to be terminally differentiated cells, limited in function, fully equipped with static content; only one option remained to enrich their functions: to borrow glycoproteins from the environment. Recent evidence is that platelets can give rise to progeny platelets¹⁸. Do these daughter cells possess identical capabilities to those of the mother cell? And are there no distinct subsets of platelets with different functions in vivo, as might be indicated by varying capacity for differential cytokine/chemokine secretion? Further, platelets are capable of using RNA to make secreted proteins^{19,20}, an issue, which was suspected as in the late 60s'²¹ and then disregarded (it is not fully consensual yet): not so a static dead-end cell after all!

-第二, 因为它们是无核的, 而且仅是巨噬细胞的碎片, 血小板曾被认为是中止分化的细胞, 功能有限, 完全充满了静态内涵物; 只剩下一个选择来丰富其功能: 从环境中借糖蛋白¹⁸。而最近证据表明血小板居然可以孕育血小板。这些姊妹细胞是否跟母细胞拥有完全相同的能力? 难道在体内就没有不同的血小板子集吗? 为什么不同的细胞因子/趋化因子的分泌有能力差异啊。进一步讲, 血小板具有利用RNA制造分泌蛋白能力^{19,20}, 这个问题在60年代末21被怀疑, 然后忽略(至今还未能完全达成共识): 无论如何, 血小板都不是那么死板而木然的细胞!

-Lastly, platelets have been considered for some time as sentinels in severe clinical infection and particularly in sepsis¹⁴. Maybe platelets are not just sentinels, but one among the primary targets of infectious pathogens, contributing to severe organ failure, especially because of their intimate relationship with leukocytes²². Platelets were recently shown to infiltrate joints and cause serious inflammatory damage. Collectively, these observations call for revisiting at least partly the therapy of certain auto-inflammatory and infectious disease: what about anti-platelet drug use? Oh yes, some are very cheap such as aspirin: but is this effective and safe? In all, anti-platelet therapy reveals itself far more complex and nuanced than previously considered²³.

-最后, 血小板被认定为严重临床感染的“卫兵”已经有一段时间了, 特别在败血症中¹⁴。也许血小板不仅仅是“卫兵”, 而且是导致严重器官功能衰竭原始感染目标之一, 特别是因为它们和白细胞的密切关系²²。血小板最近被发现可以渗透关节, 导致严重的炎症损伤。总结下来, 这些观测结果至少让我们重新审视关于自身炎

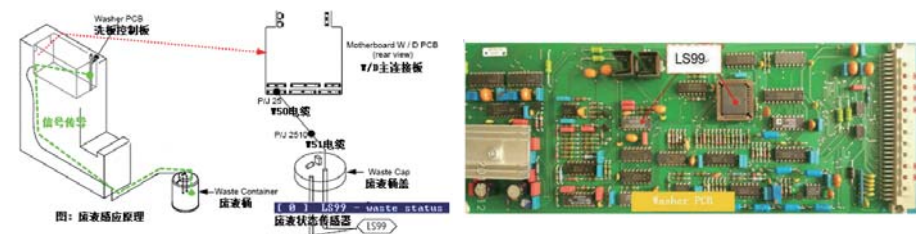
【转C2版】

浅谈FAME废液检测故障分析及维护保养

澳斯邦售后服务中心 潘建周

FAME(费米)全自动酶免分析系统, 是集全自动分配试剂、孵育、洗板、出结果于一体的高通量酶免分析设备。全程电脑控制, 实现操作过程自动化和标准化, 克服了手工操作的局限性和繁琐性。其具备美国FDA CBER验证单全自动酶免分析系统, 符合FDA体外诊断设备GMP规范及欧盟IVD指令。由于其设计的严谨性和独特品质(如模块化设计技术、条码技术识别管理技术、液体水平检测LLD技术、实验跟踪系统TRACE与溯源性技术等), 备受广大用户的青睐。现就应用中的常见问题, 废液检测总结如下:

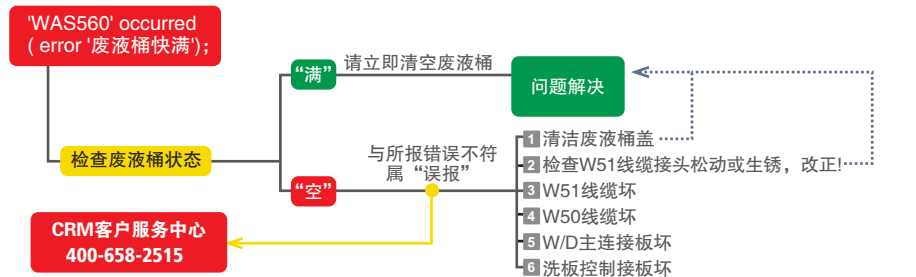
一、废液感应原理



二、常见错误

'WAS560' occurred (error '废液桶快满')

故障处理



三、维护保养

- 1) 废液桶中严禁直接放入含氯消毒剂, 防止废液桶盖被腐蚀;
- 2) 日维护时, 清空废液桶;
- 3) 周维护和月维护时, 清空并清洁废液桶(可用84消毒液消毒废液桶, 但再次使用前, 请用自来水冲洗干净)。首先用FAME专用消毒液(无腐蚀性)消毒废液桶盖, 其次再用蒸馏水润湿的纸巾清洁, 最后用纸巾擦干桶盖。

注意: 维护保养时, 请做好生物安全防护措施, 遵循GLP。

症和感染性疾病已经确立的治疗方法: 如何使用抗血小板药物? 噢, 对的, 有些确实很便宜如阿司匹林; 但它是有效及安全的吗? 总之, 抗血小板治疗自爆出更加复杂和更加细微的问题, 远比以前大家认知的要严重²³。

In aggregate, platelets span the classic field of hemostasis and thrombosis and the novel field of immunology and inflammation. Even transfusion medicine gurus are confused. Most were taught that low platelet counts below a given threshold (ranging from 10,000 to 30,000/ μ L of blood) require a platelet transfusion; now, they are kindly advised that all platelet transfusions are not equal and some transfusions may well be more pro-inflammatory than others^{24,25}. How can they choose? They cannot, because the blood bank has made the choice for them: they are left with some confusion and concerns for their patients. Of note, this last paragraph would certainly not have been appropriate for the hypothetical science writer, because it does not speak to current reality of medical practice. Well, maybe not yet; but physicians and scientists are making significant progress in rendering platelet transfusion definitely much safer in terms of reduction of immunological hazards, and detecting genetic predisposition to harm^{26,27}. Thus, we have the new general understanding that platelets are not that simple, after all, and that there may well be much more to learn again.

综上所述, 血小板横跨经典的止血和血栓形成领域到新颖的免疫学和炎症领域。甚至输血医学界的权威也感到困惑。大多医生被教导的是在血小板计数低于给定的阈值时(从10,000到30,000/ μ L的血), 需要进行血小板输注; 现在他们被友善的建议, 并不是所有血小板输血的情况都一样, 有些输血非常有可能引起发炎^{24,25}。那让他们怎么选呢? 其实他们没得选, 因为血液中心已经为他们做了选择: 他们只能徒留一些困惑和对患者的忧虑。值得注意的是, 这最后一段当然不适用于本文中敢于猜想的学者, 因为它不代表目前现实的医疗实践。也许还不是; 但是, 从减少免疫伤害和检测遗传倾向性伤害的角度, 医生和科学家正在取得显著的进展, 这将使血小板输注更安全^{26,27}。因此, 我们已经有了新的普世理解: 无论如何, 血小板都不是那么呆板, 而且, 很可能有更多的需要我们去学习和领教。

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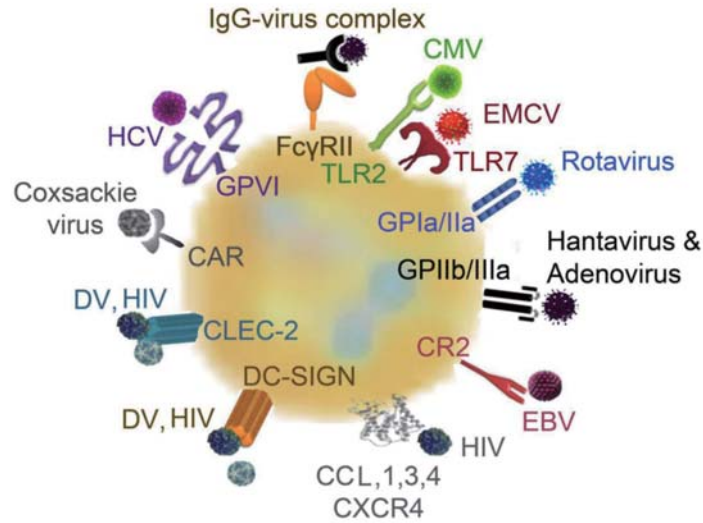
E1 澳斯邦知识精选 进一步了解血小板

血小板与疫病诊断相关综述;

血小板与病毒1

Assinger A (2014) Platelets and infection – an emerging role of platelets in viral infection. *Front. Immunol.* 5:649. doi: 10.3389/fmmu.2014.00649

血小板病毒受体: 血小板和病毒通过大量的表面受体直接相互作用
Platelet receptors for viruses: platelets and viruses can directly interact via a plethora of surface receptors.

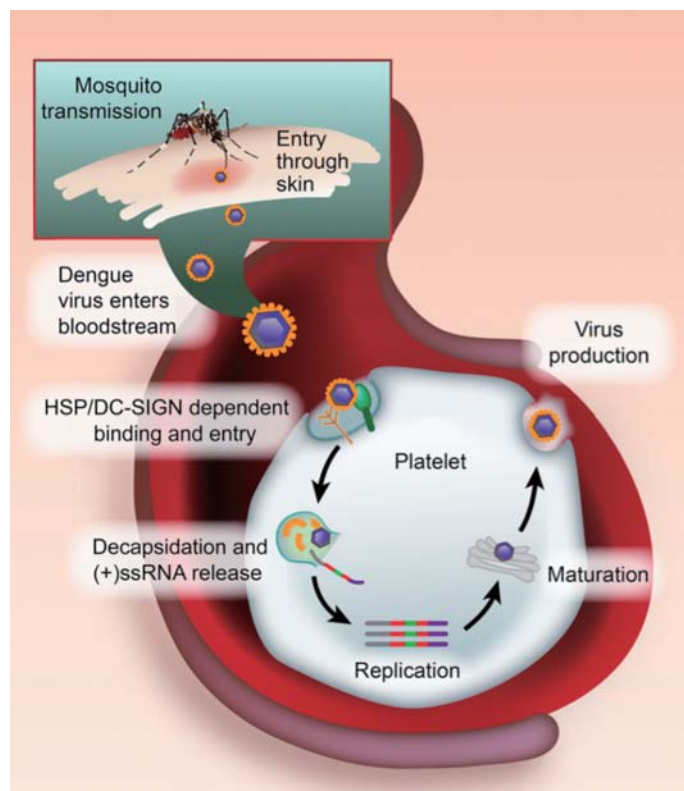


血小板与病毒2:

Dengue virus pirates human platelets. *Blood.* 2015 126 286–7. doi:10.1182/blood-2015-05-647362

登革热病毒被血小板结合和复制的模式

Model of DENV binding and replication by platelets.

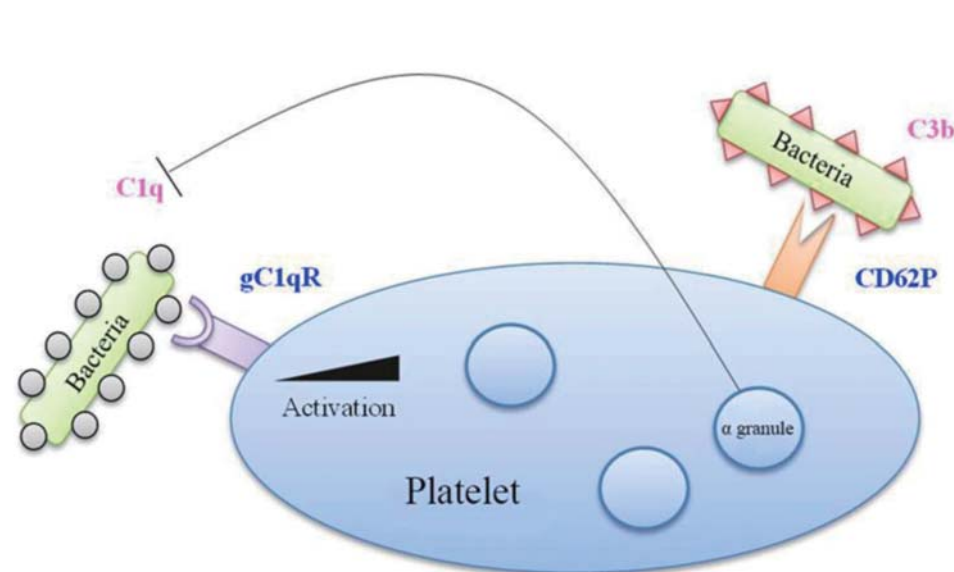


血小板与细菌

Hamzeh-Cognasse H, Damien P, Chabert A, Pozzetto B, Cognasse F and Garraud O (2015) Platelets and infections – complex interactions with bacteria. *Front. Immunol.* 6:82. doi: 10.3389/fmmu.2015.00082

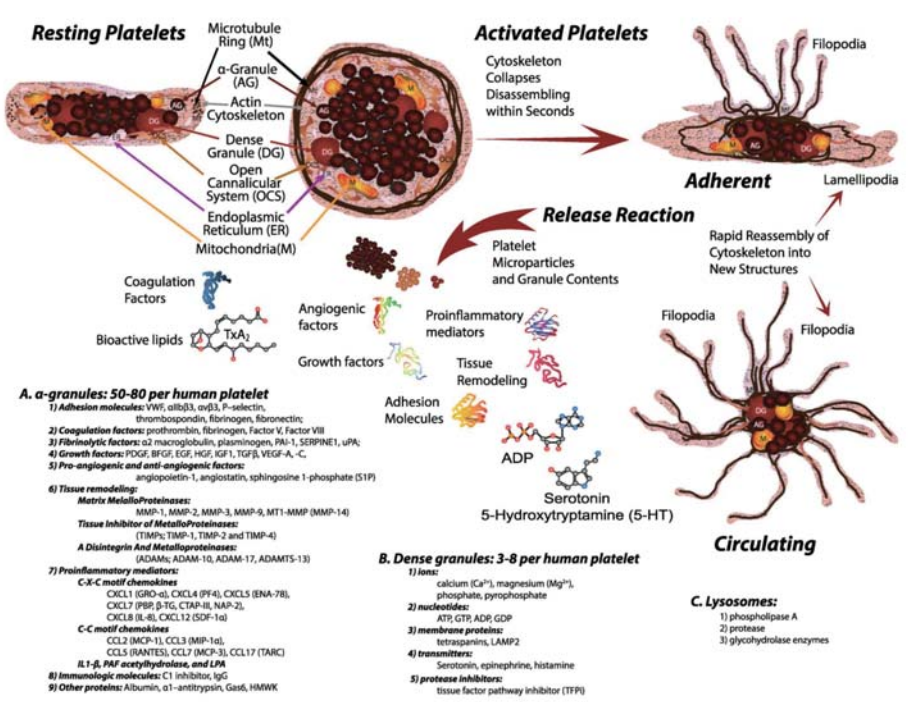
细菌与血小板结合的补体因子

Complement factors in bacterial binding to platelets.



血小板与癌症细胞

Platelets and cancer: a casual or causal relationship: revisited. *Cancer Metastasis Rev.* 2014 March ; 33 (1) : 231– 269. doi:10.1007/s10555-014-9498-0.

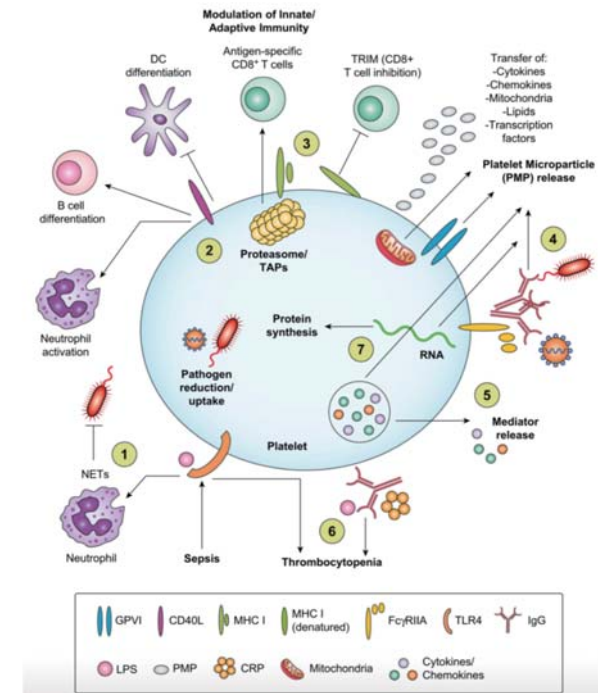


血小板与炎症

Nouvelle cuisine platelets served with inflammation. *J Immunol* 2015 194 5579–87

血小板在调节炎症过程中的关键作用

The key roles of platelets in modulating inflammatory processes.



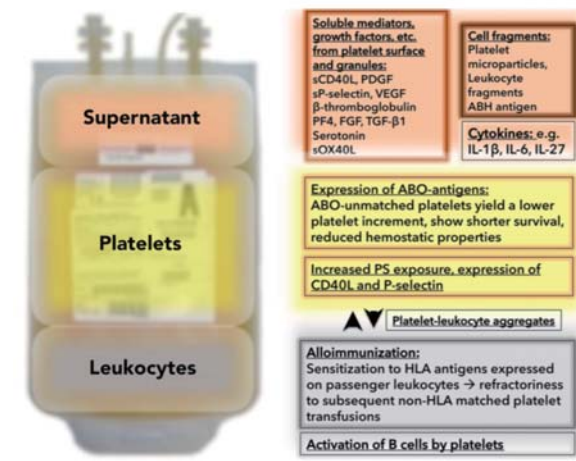
血小板与输血

Stolla M, Refaai MA, Heal JM, Spinelli SL, Garraud O, Phipps RP and Blumberg N (2015) Platelet transfusion the new immunology of an old therapy. *Front. Immunol.* 6:28. doi: 10.3389/fmmu.2015.00028

在血小板制备时意外成客和情况:

除了血小板, 血小板浓缩液还包含“意外成客”: 上清部分含有可溶性调节因子(在未洗涤的血小板浓缩液中, 这是几乎所有美国医院的常规产品), 下层部分是白细胞(在未去白的血小板浓缩液中, 在一些美国医院仍被使用的产品)

Unwanted passengers and events during platelet storage: Besides platelets, platelet concentrates contain “unwanted passengers” in the form of soluble mediators in the supernatant (in the case of unwashed platelet concentrates which are still the routine product in virtually all US hospitals) and leukocytes (in the case of non-leukoreduced platelet concentrates which are still an available product in some US hospitals).



- Soluble mediators, growth factors, etc. from platelet surface and granules:** sCD40L, PDGF, sP-selectin, VEGF, β-thromboglobulin, PF4, FGF, TGF-β1, Serotonin, sOX40L.
- Cell fragments:** Platelet microparticles, Leukocyte fragments, ABH antigen.
- Cytokines:** e.g. IL-1β, IL-6, IL-27.
- Expression of ABO-antigens:** ABO-unmatched platelets yield a lower platelet increment, show shorter survival, reduced hemostatic properties.
- Increased PS exposure, expression of CD40L and P-selectin**
- Platelet-leukocyte aggregates**
- Alloimmunization:** Sensitization to HLA antigens expressed on passenger leukocytes → refractoriness to subsequent non-HLA matched platelet transfusions.
- Activation of B cells by platelets**