

# QC Microbiology, GMP, and Social Media: Results of an Industry Survey

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The use of social media has exploded in recent years. This has been a disruptive change, affecting the recording, broadcast, and print industries, among others. However, the individual social media technologies as a means of communication and training have generally been derided in the media due, in part, to the generally youthful nature of the early adopters and the ease that the different media may be abused. That does not mean that the opportunities are not available, or that “serious” scientific organizations are not attempting to participate—quite the contrary (1, 2).

However, it is undeniable that social media has an image problem. For example, at a recent industry meeting, the author participated in a discussion of how the legitimate use of preservatives in products was losing in the court of public opinion, making it increasingly difficult to formulate safe products that would be acceptable in the marketplace. When the question was raised as to why social media was not being used aggressively to support the use of preservatives where needed, the immediate response was that it was because “we are not 15-year old girls.” This knee-jerk reaction to the use of social media blinded the meeting to the fact that their opponents in this debate were using that same “15-year old girl” to beat them up.

Beyond the public opinion considerations, social media offers enormous opportunities for benchmarking practices and training staff. We need to be open to the possibilities that this area offers—it is too late to believe it will all go away or that it is not a serious method of communication. We cannot afford to waste opportunities of this magnitude.

There are a variety of useful information sources for the quality control (QC) microbiologist in social media, including chances to benchmark practices, training opportunities, and enjoyable avenues to keep current with the latest in news and

developments in virtually any area of interest. All it takes is a little research and an open mind.

## Survey of Social Media Usage

The Microbiology Network recently conducted a survey of social media usage by QC microbiologists. This survey was conducted online, and in a two-week period had 385 people fill out at least a portion of the 10-question form. Two hundred seventy two of these completed the form, but seven noted that they did not use social media and so were not included. These results of social media usage are based, therefore, on the 265 remaining.

It should be noted that this is by no means a random survey of the QC microbiology population. The survey was primarily mailed out to users of the PMFList, and was posted on the Microbiology Network Facebook page as well as several LinkedIn discussion groups. It must therefore be assumed that the respondents are more technologically sophisticated than is the norm.

The majority of the responses came from subscribers to the PMFList and the industry makeup of the valid respondents is presented in Figure 1. It seems that this group at least had familiarity with social media on its side. Of the valid respondents, 70% reported actively participating in at least one form of social media (the other 30% presumably “lurkers”—monitoring the social medium without participating in the discussions).

The survey looked at two main questions: which social media platforms are used and what are they used for?

As to the first question, Figure 2 provides a Pareto Chart of social media usage. The different types social media platforms will be discussed in the order of this chart.

Figure 1: Industry Representation of Valid Survey Respondents.

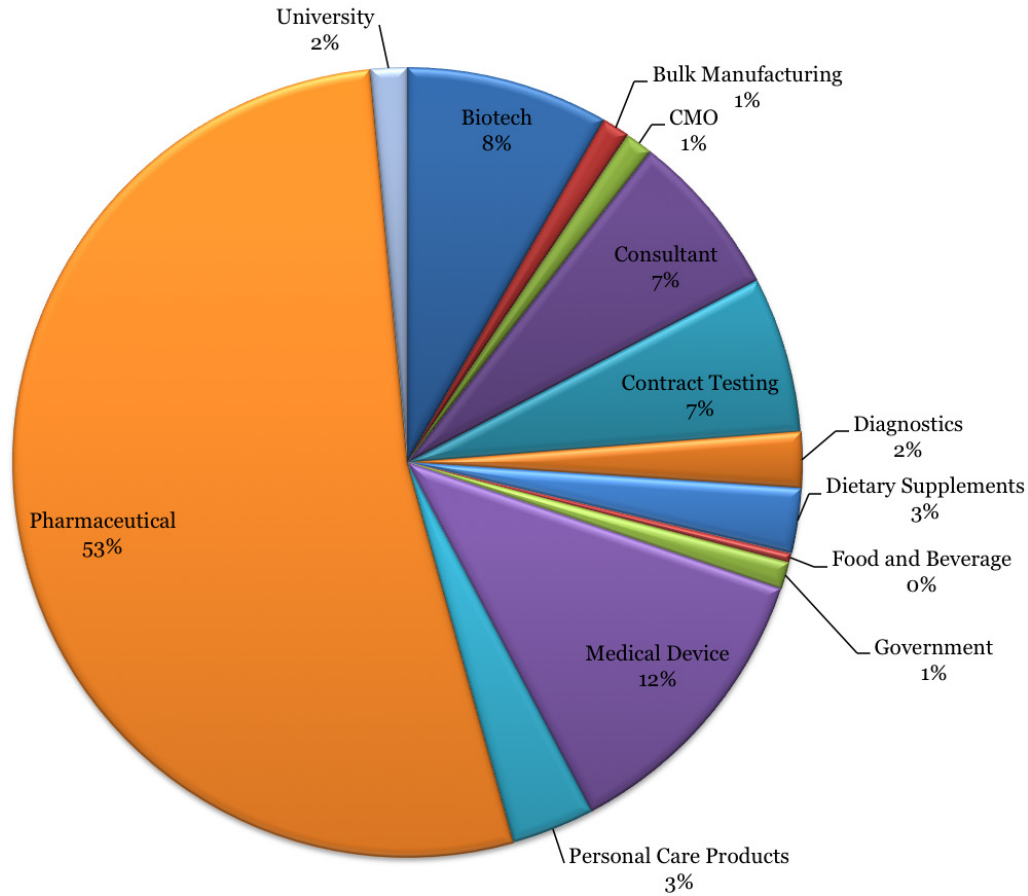
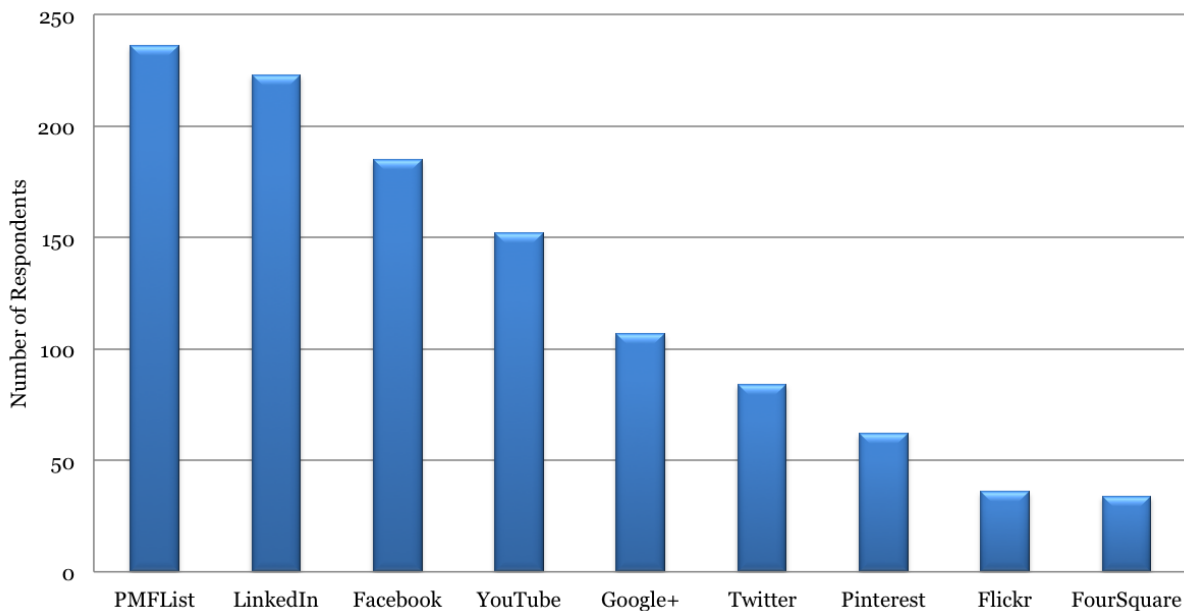


Figure 2: Respondents Participation in Social Media.



### Email Discussion Groups

The basic concept for an email discussion group is to encourage discussion around a unifying topic.

The basic mechanism is to have a central email address to which all mail is sent. If a subscriber has a question or comment, it is sent by email to that

address. The email is then resent to all participants. If one (or more) participant wishes to comment on the email, then that reply is then sent to the central address for redistribution and the cycle repeats.

Prior to 1986, all email discussion groups were manual. There was a person who was physically forwarding all emails out to the list, a very laborious (and usually voluntary) effort. In 1986, an automated listserv was developed (LSoft Corp) that made this task far easier.

The email discussion group is by far the most established of the social media to be discussed in this paper (the only older one internet social medium is Usenet that has fallen into obscurity). This medium has an established history of use in medicine and science (3-6).

There are two email discussion groups of use to the QC microbiologist—the PMFList and the PSDGList. Both of these lists are moderated—that is to say all emails distributed on the lists are reviewed by the moderator for appropriateness (Note: The author moderates both of these lists. The tests for “appropriateness” include civility, relevance, and an attempt at correct spelling and grammar. There is no requirement that the moderator agree with the content of the email.).

The PMFList is specifically directed at QC microbiology. It began as part of The Microbiology BBS (a land-line based bulletin board system) in 1995 and then moved to the Internet at the end of 1997. There is a complete, searchable archive of all messages from 1998 available.

The Pharmaceutical Stability Discussion Group Email List (PSDGList) was established early in 1989 by an interested group at Bristol-Myers Squibb. The purpose of this list was to provide a forum for pharmaceutical scientists to exchange ideas and experiences about stability-related issues, and this list enjoyed a great deal of popularity. However, the labor and cost involved in the maintenance of the service forced its closure early in 2005. This list was relaunched on September 1, 2005 and has a searchable archive from that date.

Use of the PMFList (as well as the other social media platforms to be discussed) is presented in Table I. “Benchmarking” and “Current Events” are the majority of the respondent’s uses for PMFList.

### LinkedIn Discussion Groups

The professional social media site LinkedIn

provides several different opportunities for the QC microbiologist, so it is no surprise that this is a popular service (7). The primary purpose of this social medium is to provide an opportunity for professionals to communicate. As such, the user’s “profiles” are organized much like a resume—including opportunities to list previous employment, education, references, publications, etc.

LinkedIn also provides the users with an opportunity to participate or even create “discussion groups” that operate as bulletin board services where people post messages on the website, and others may comment on those postings. Each discussion group has a separate area for promotions (to minimize direct commercial appeal) and jobs. A selected list of LinkedIn groups is presented in Table II. The primary uses for this service are “Personal Interest” and “Benchmarking” according to the respondents (see Table I).

### Facebook

Facebook is one of the services that defines social media today, thanks in no small part to movies and the popular press. This is more of a pure social media, with the focus on individual’s information and relationships. With over one billion users claimed, this service is very open to a variety of uses. In addition to the individual’s “profile” information (relationships, “friends”, photos, etc.) there is also the opportunity for company pages that can promote a service or products with coupons, specials, information, etc. Both the individual’s profile and the company page offer an opportunity to provide a news feed and to promote events. Many individuals and companies use these news feeds to disseminate information and commentary with links to additional information on the web.

The majority of use respondents reported from Facebook was for “Personal Interest.”

### Twitter

Established in 2006, Twitter is a messaging service that allows users to post short (140 character) “tweets” to their followers. Twitter is the service most open to abuse, and it is often abused by tweets of absolutely no interest to anyone except the person writing the message. However, it also offers a good way to rapidly disseminate information. Far from being the exclusive domain of the preteens, many

**Table I:** Purpose of Social Media Usage<sup>†</sup>

	Benchmarking	Current Events	Personal Interest	Training	Other/Don't Use
PMFList	25	27	24	14	13
LinkedIn	22	13	44	6	18
Facebook	0	5	62	4	32
YouTube	1	6	40	9	44
Google+	3	10	26	3	61
Twitter	0	10	20	2	69
Pinterest	0	2	21	0	77
Flickr	0	2	11	0	87
FourSquare	1	3	9	0	88

<sup>†</sup>Expressed as percentage of respondents

serious organizations are using this service to get information out quickly and direct people to web-based information sources.

The very brevity of the tweet format can encourage concise expression of ideas and concepts. This characteristic has been used to good effect as a teaching tool with nursing students (7).

A select listing of twitter feeds is provided in Table III.

Relatively few (30%) of respondents were using Twitter at the time of the survey, and their use was split between “Current Events” and “Personal Interest” (see Table I). The slow adoption of Twitter is particularly unfortunate as many of the Twitter feeds listed in Table III function primarily as a “headline service” with links to websites, blogs, and news articles of interest to the microbiologist.

### Blogs

Blogs are basically online journals that are presented by an individual or group. This form of web publishing has exploded in recent years due to the ease of blogging and the multitude of hosting services available. The growth of the blogosphere has become so pervasive that the continued viability of print magazines is a topic of serious discussion (9). After all, why pay for a magazine when the same information at comparable writing level is available free and can be tailored to your specific interests?

Many blogs are published on a regular basis that would be of interest to the QC microbiologist or quality professional—in some regards, these may well serve to replace journals in terms of timely information. In addition, the ease and low cost of blogging encourages groups with alternative viewpoints to publish easily. The educational

opportunities in this medium are obvious (2, 4)

Blog usage seems popular in the technically sophisticated microbiology world. Fifty-four percent of respondents in the recent survey stated they read blogs on a regular basis. A select listing of blogs is presented in Table IV.

### Podcasts

Podcasts are fundamentally a radio show or a television show broadcast over the internet to a compatible device. Avoiding the public airwaves, this technology provides broadcast capability to

**Table II:** Selected List of LinkedIn Discussion Groups

<ul style="list-style-type: none"> <li>• American Society for Microbiology</li> <li>• Bacterial Endotoxins (LAL) Discussion group</li> <li>• Biofilm Interest Group</li> <li>• Environmental Monitoring of Cleanrooms and Utilities</li> <li>• Global QA/QC Management</li> <li>• Microbiology Jobs</li> <li>• Microbiology Professionals</li> <li>• Pharmaceutical Microbiology</li> <li>• Pharmaceutical Microbiology Forum</li> <li>• Pharmaceutical Regulatory CMC</li> <li>• Pharmig</li> <li>• PICS/GMP</li> <li>• Rapid Microbiology Methods</li> <li>• Society for Applied Microbiology</li> <li>• Society for Industrial Microbiology and Biotechnology (SIMB)</li> <li>• Society of Cosmetic Chemists</li> <li>• Society of Cosmetic Scientists</li> <li>• Sterility Assurance Discussion Forum</li> <li>• Sterilization of Pharmaceuticals, Medical Devices &amp; Biological Materials</li> <li>• USP Discussion Forum</li> </ul>
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Table III: Select Listing of Twitter Feeds.

Organizations	Individuals
@ASMicrobiology	@chronsciguy
@bbchealth	@DrJudyStone
@FDACBER	@DrMicrobiology
@FiercePharma	@EpiDoctor
@HHSGov	@EvidenceMatters
@laboratorynews	@eyeonfda
@latimescience	@markowenmartin
@microbiology	@marynmck
@NatureOutlook	@MicrobeLover
@NIHforHealth	@MicroBytes
@Pharmaceutical	@pharmagossip
@PharmaTimes	@pharmaguy
@sciencepodcasts	@Profmicro
@scifri	@Rubeola
@SocGenMicro	@sciencecomedian
@TheLancet	@sciencegoddess
@TimesScience	@sciencenewsgeek
@USDAFoodSafety	@Sponch2
@USPharmacopeia	@timsandle
@VacciNewsNet	@wolfemi
@WHO	

any individual or organization with a modicum of technical ability. Podcasts are a relatively recent development, gaining in popularity since around 2005. One of the large contributors to podcast development was Apple, whose iTunes release in 2005 had native support for podcasts, which also virtually shut down development of other podcast media due to the overwhelming presence of iTunes in the marketplace. Podcasts can be in virtually any format, although audio and videos are the primary formats available.

There are a variety of podcasts available through the iTunes store (free subscriptions through the iTunes store) and on independent servers. A select listing of podcasts is provided in Table V. Only 18% of the respondents listened to podcasts regularly.

### Other Services

Other social media services included in the survey were:

- YouTube
- Google+
- Pinterest
- Flickr
- Foursquare.

None of these social media were widely used by the respondents, especially not for professional

Table IV: Select Listing of Blogs.

QC Microbiology Blogs	
Barry Friedman's Blog	<a href="http://barryfriedmanphdllc.wordpress.com/">http://barryfriedmanphdllc.wordpress.com/</a>
Tim Sandle	
Digital Journal	<a href="http://digitaljournal.com/user/429626/blog">http://digitaljournal.com/user/429626/blog</a>
The RMM Blog	<a href="http://blog.rapidmicromethods.com/">http://blog.rapidmicromethods.com/</a>
General Microbiology Blogs	
Micro Writers	<a href="http://micro-writers.egybio.net/blog/">http://micro-writers.egybio.net/blog/</a>
MicrobiologyBytes	<a href="http://www.microbiologybytes.com/blog/">http://www.microbiologybytes.com/blog/</a>
Microblogology	<a href="http://www.microblogology.com/">http://www.microblogology.com/</a>
Small Things Considered (ASM Blog)	<a href="http://schaechter.asmblog.org/">http://schaechter.asmblog.org/</a>
Twisted Bacteria	<a href="http://twistedbacteria.blogspot.com/">http://twistedbacteria.blogspot.com/</a>
The Tree of Life	<a href="http://phylogenomics.blogspot.com/">http://phylogenomics.blogspot.com/</a>
Other Science Blogs of Interest	
AAPS Blog	<a href="http://aapsblog.aaps.org/">http://aapsblog.aaps.org/</a>
GreenChemBlog	<a href="http://greenchemblog.wordpress.com/">http://greenchemblog.wordpress.com/</a>
The AME Food Testing Show	<a href="http://www.blogtalkradio.com/ame-foodtestingshow">http://www.blogtalkradio.com/ame-foodtestingshow</a>
In the Pipeline	<a href="http://pipeline.corante.com/">http://pipeline.corante.com/</a>
RRResearch (Rosie Redfield)	<a href="http://rrresearch.fieldofscience.com/">http://rrresearch.fieldofscience.com/</a>
Medical Packaging Innovation	<a href="http://www.medicalpackaginginnovation.com/bloggers.asp">http://www.medicalpackaginginnovation.com/bloggers.asp</a>
Discover Magazine Blogs	<a href="http://blogs.discovermagazine.com/">http://blogs.discovermagazine.com/</a>
Scientific American Blog Network	<a href="http://blogs.scientificamerican.com/">http://blogs.scientificamerican.com/</a>
Superbug Wired Science Blog	<a href="http://www.smithsonianmag.com/">http://www.smithsonianmag.com/</a>
WiSci The Wiley Life Sciences Blog	<a href="http://wisciblog.com/">http://wisciblog.com/</a>
Smithsonian Magazine Blog	<a href="http://www.smithsonianmag.com/">http://www.smithsonianmag.com/</a>
NPR Blogs	<a href="http://www.npr.org/blogs/">http://www.npr.org/blogs/</a>



**Table V:** A Select Listing of Podcasts.

<p><b>Available from iTunes</b></p> <ul style="list-style-type: none"><li>• ASM TWIM – This Week in Microbiology</li><li>• ASM TWIV – This Week in Virology</li><li>• First Fridays Science Discussion</li><li>• FirstWord Pharmaceutical News</li><li>• Microbe Talk</li><li>• Microbe World</li><li>• Micropod (Society for Applied Microbiology)</li><li>• Pharmaceuticals &amp; Biotechnology</li><li>• Science and the City</li><li>• Science Friday</li><li>• Science Weekly</li><li>• The Naked Scientist</li></ul> <p><b>Available from Podfeed (<a href="http://www.podfeed.net/tags/microbiology">http://www.podfeed.net/tags/microbiology</a>)</b></p> <ul style="list-style-type: none"><li>• MicrobiologyBytes</li><li>• Intimate Strangers: Unseen Life on Earth</li><li>• MicrobeWorld Radio</li><li>• Microbe Talk</li><li>• Meet The Scientist</li><li>• Science and the City</li><li>• Life Lines - A Podcast of the American Physiological Society</li></ul>
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purposes.

## Conclusion

Social media offers a wealth of information and capabilities to the QC microbiologist, but few are taking advantage of the opportunities presented. The under-utilization of social media seems to represent a missed opportunity by QC microbiologists to interact with others across the country and across the world as well as providing the potential for training at a fraction of the traditional cost. This survey also shows that once a technology matures (for example the PMFList and the PSDGList Email discussion groups), participation becomes enthusiastic.

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