Among the many honors bestowed at the AARC International Respiratory Congress last December were those given to students who have written exemplary research papers through the American Respiratory Care Foundation’s (ARCF) Education Recognition Award Program. The awards given to these fledgling authors are well deserved. These students represent a very important future resource for the respiratory care profession. As the millennium unfolds, many of the “old guard” will be retiring. We must develop a continuous supply of RC professionals with the talent, intellect, and energy to assume the reins of leadership. These awardees are among that group. By competing in the ARCF program, these students have not only learned to how conduct research, but also how to communicate their findings in a professional manner.

The awards that these students receive also honor their mentors. Usually, there is an interested, motivating professor somewhere behind such achievements, and we should commend those mentors for their contributions in developing leaders for the future of the profession. We are proud and pleased to publish the winning student papers, which will appear in this and forthcoming issues as space permits, in our Bulletin.

If you are reading this issue of Bulletin, you will have survived the Y2K bug! On behalf of the Education Section membership, I wish you a happy and productive 2000.

Speaking of wishes and resolutions, January is a time to set new goals for the new year. I would like to ask you to consider the following as you formulate your professional goals for the year 2000:

Send in your research abstracts for presentation at the Summer Forum in Vail, CO, and International Respiratory Congress in Cincinnati, OH. (Contact Gudi Pryor at zzpryor@washburn.edu.)

Submit a research paper to the Education Annual. (Contact David Shelledy at shelledy@uthscsa.edu.)

Write an article of interest for the Education Bulletin. (Contact Arthur Jones at jonesap@uthscsa.edu.)

Volunteer to serve on one of six Education Section Committees. (Contact David Chang at chang_david@colstate.edu.)

Thank you for your continuing support, and Happy New Year!
“NBRC” continued from page 1

testing at 87 sites around the country on January 10. We have completed production of a new candidate handbook package which consists of general information outlining the application policies and procedures for all of the NBRC’s examination programs, a generic application form to be used to apply for any of the five examinations, and examination-specific content outlines. These handbooks are designed to be reference materials that can be kept for use over a period of time. A supply of the new candidate handbooks was sent to all accredited education programs in late December. Additional applications are always available upon request.

New web-based self-assessment examinations

In addition to computer-based testing for credentialing purposes, the NBRC will be offering self-assessment examinations via the web site (www.nbrc.org). This exciting new service will provide students the freedom to experience not only the opportunity to evaluate their preparation for the credentialing examinations, but to become comfortable with the examinations offered on the computer. A new self-assessment brochure offering these new products, their prices, and the release schedule was mailed to all accredited education programs in late December. Please note: paper and pencil self-assessment examinations will remain available.

How you can help

The implementation of computer-based testing and the use of technology to enhance current self-assessment products and services are steps toward providing more flexibility for national credentialing candidates. Please assist us in encouraging your graduates to apply for a computer-based testing examination in 2000 and your colleagues to participate in the voluntary recredentialing process. Credentialed practitioners may already attempt their respective examinations for voluntary recredentialing every three years.

In addition, please provide feedback to us regarding this transition into technology. We are committed to building a strong computer-based testing program that is responsive to the needs of the respiratory care community. Your comments will help us achieve this goal and continue to improve the credentialing system for the profession.

Lastly, we are interested in your ideas and suggestions for future NBRC columns in this Bulletin. You may send your thoughts to: Michelle A. Cheney, MBA, assistant executive director, National Board for Respiratory Care, 8310 Nieman Road, Lenexa, KS 66214, (913) 599-4200, extension 478, FAX (913) 541-0156, e-mail: mcheney@nbrc.org.

Montelukast, Zafirlukast, and Zileuton, Leukotriene Inhibitors in the Treatment of Asthma

by Gelicia C. Jackson

Editor’s Note: Gelicia C. Jackson is the 1999 recipient of the ARCF Jimmy A. Young Memorial Education Recognition Award. She was recognized at the AARC International Respiratory Congress held last December in Las Vegas, NV. Gelicia is a student in the respiratory care program at Georgia State University in Atlanta. To obtain information on this and other competitive awards for RC students, contact the American Respiratory Care Foundation at (972) 243-2272.

Asthma is an important health problem around the world today, affecting 14.6 million Americans alone, according to the American Lung Association. Asthma is currently known as a disease where there is chronic inflammation of the airway, which causes airflow obstructions and hyperresponsiveness to stimuli. For a number of years, bronchodilators and corticosteroids have been an effective means for the treatment of asthma. Bronchodilators, such as β-agonists (salmeterol, albuterol) and methylxanthines, have been proven to effectively stop asthma attacks after they have started.1 Moreover, corticosteroids, such as prednisone (Deltasone), have effectively been proven to prevent asthma attacks from starting.2 While existing treatments prove to be effective, asthma continues to be a clinical problem that needs new, innovative treatments.

New understanding of asthma has revealed a number of aspects that have added a new direction to asthma therapy. A complex network of inflammatory cells which excrete mediators, such as histamine, cysteinyl leukotrienes, and eosinophil products, has been found.3 The discovery of this new information has caused conventional views about asthma and asthma treatments to change. Because of the recent advances in the understanding of the pathophysiology of asthma, a new emerging asthma therapy has developed.4 This new therapy, known as antileukotriene therapy, involves a new class of medications that will block the action of leukotrienes (LT).

This new class of medications includes three LT inhibitor drugs: zafirlukast (Accolate), zileuton (Zyflo), and montelukast (Singular), which have been effectively proven in clinical trials to block the activity of leukotrienes. The purpose of this paper is to review the physiology, pharmacology, and the clinical application of the antileukotriene agents in the treatment of asthma.

Leukotrienes

Leukotrienes are identified as inflammatory lipid mediators that are synthesized from arachidonic acid.1 The name leukotriene reflects their production from and action on leukocytes (“leuko,” meaning white blood cell, and “trienes,” meaning a characteristic chemical feature).5

Biosynthesis

Leukotrienes make up a class of inflamma-
”Asthma” continued from page 2

Cysteinyl leukotrienes (cysLTs) are originally described through their activity as “slow-reacting substance of anaphylaxis” (SRS-A). Cysteinyl LTs are released by inflammatory cells, which are present in the airways of asthmatic individuals, and have become leading targets for new asthma therapies. The cysLTs have been implicated as important mediators in the pathophysiologic mechanisms of asthma. Cysteinyl LTs directly contract airway smooth muscle. The cysteinyl leukotrienes are produced by a number of cell types, particularly mast cells and macrophages. Mast cells generate several mediators, including histamine, and synthesize the cysLTs, while macrophages generate LTB4 and the cysLTs as well. Because both mast cells and macrophages are found in the airway, they can be sources of cysLTs when activated. LTC4 and LTD4 have proven to be 1,000 times more potent than histamine in the contraction of the bronchus, with a longer duration of action. Are constricted by cysLTs. These vasodilating and bronchoconstricting effects of cysLTs suggest their central role in asthma. In contrast, the role of LTB4 in asthma is unclear. Leukotriene B4 is a chemoattractant that stimulates chemotactic activity for neutrophils and the release of mediators and enzymes. Leukotriene B4 may have an indirect effect due to the stimulation of interleukin (IL)-5 production by T-cells and promotion of the effects of IL-4 on IgE production by B-cells. Because of the specificity for neutrophil recruitment into the lung, LTB4 has the capacity to activate those cells, causing inflammation.

Cysteinyl leukotrienes also stimulate hypersecretion of mucus in human airways. LTs, LTD4, LTB4, LTC4, and LTD4 are released by inflammatory cells, which are present in the airways of asthmatic individuals. Although cysLTs are not the only mediators responsible, they do exert many effects that correspond with the clinical expression of asthma, such as increased microvascular permeability and hypersecretion of mucus. Leukotrienes, LTC4, LTD4, and LTD4, also cause constriction of bronchial muscle and vascular smooth muscle. However, although minor compared to cysLTs, LTB4 is likely to play a role in asthma as well. Because of the effects that these leukotrienes cause, they are the main focus in the pathophysiologic mechanisms of asthma. Cysteinyl LTs directly contract airway smooth muscle. The cysteinyl leukotrienes are produced by a number of cell types, particularly mast cells and macrophages. Mast cells generate several mediators, including histamine, and synthesize the cysLTs, while macrophages generate LTB4 and the cysLTs as well. Because both mast cells and macrophages are found in the airway, they can be sources of cysLTs when activated. LTC4 and LTD4 have proven to be 1,000 times more potent than histamine in the contraction of the bronchus, with a longer duration of action.

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In human skin, LTC4 and LTD4 produce flare responses and increase maximal airway narrowing induction in normal patients. Both large and small airways of asthmatic patients are constricted by cysLTs. These vasodilating and bronchoconstricting effects of cysLTs suggest their central role in asthma. In contrast, the role of LTB4 in asthma is unclear. Leukotriene B4 is a chemoattractant that stimulates chemotactic activity for neutrophils and the release of mediators and enzymes. Leukotriene B4 may have an indirect effect due to the stimulation of interleukin (IL)-5 production by T-cells and promotion of the effects of IL-4 on IgE production by B-cells. Because of the specificity for neutrophil recruitment into the lung, LTB4 has the capacity to activate those cells, causing inflammation.

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the two basic modes of action for the inhibition of leukotriene effects are inhibition of leukotriene synthesis and antagonism of leukotriene receptors, respectively. Although there are many different approaches available for inhibiting leukotriene synthesis, 5-lipoxygenase (5-LO) inhibitors seem to be the most effective. However, the antagonism of leukotriene receptors occurs through the use of specific cysteinyl leukotriene receptor antagonists to block the actions of cysteinyll leukotrienes.

Inhibitors of 5-LO prevent not only the synthesis of LTB₄; these inhibitors prevent that of cysteinyl leukotrienes as well. 5-LO inhibitors inhibit LT biosynthesis by directly inhibiting 5-lipoxygenase by binding to the 5-LO activating protein, which has been proven by the antileukotriene agent zileuton. Zileuton is a 5-LO inhibitor that directly blocks the catalytic activity of 5-lipoxygenase itself, and is one of the three currently available antileukotriene drugs.

Leukotriene receptor antagonists inhibit several agents that provoke narrowing of the airway in asthma. Receptors for leukotrienes are categorized into two classes: receptor for LTB₄, known as BLT₁-receptors, and receptors for cysteinyl leukotrienes, known as cysteinyll leukotriene receptors (cysLT₁). Of the cysLT₁ receptors, there are two subgroups, known as cysLT₁ and cysLT₂. CysLT₁ receptor antagonists specifically block the effects of cysLT₁, but do not affect LTB₄. Montelukast and zafirlukast are examples of cysLT₁ receptor antagonists that have proven to be effective. Montelukast inhibits LTD₄ while zafirlukast is a receptor antagonist of LTD₄ and LTE₄, which are components of SRS-A.

**Pharmacology**

Inhibitors of the synthesis of leukotrienes, zileuton, and leukotriene receptor antagonists, montelukast and zafirlukast, have improved pulmonary function as well as asthma symptoms. Because these medications have been shown to be well tolerated and effective in the treatment of asthma, they have recently been approved by the FDA for general clinical use.

**Montelukast**

Montelukast, also known as Singulair, is a potent, specific leukotriene receptor antagonist that has shown a substantial block of airway leukotriene receptors as long as 24 hours after dosing. This receptor antagonist is an orally active drug with a dosage of 10 mg. for a film-coated tablet and 5 mg. for a chewable tablet. In the metabolism of arachidonic acid, the cysteinyl leukotrienes are produced. These cysteinyl leukotrienes then bind to the cysLT₁ receptors in the human airway. Montelukast will bind to the cysLT₁ receptor, blocking the actions of LTD₄ at that cysLT₁ receptor site. This antileukotriene drug has shown a clinical benefit for patients with chronic asthma. In addition to improving airway obstruction, montelukast also provides protection against episodes of worsening asthma. Therefore, montelukast (Singulair) has provided a definite clinical benefit to chronic asthma patients.

**Zileuton**

Zileuton, also called Zyflo, is a specific inhibitor of 5-lipoxygenase that is a controller agent rather than a reliever. This drug is administered orally in a 600 mg. tablet daily (Table 1). Zileuton inhibits LT formation by first inhibiting the 5-lipoxygenase, which would catalyze leukotriene formation. 5-LO, while in the presence of FLAP, will catalyze the conversion of arachidonic acid to prostaglandins and LTE₄, followed by that of the other leukotrienes. However, by inhibiting the conversion of arachidonic acid to these other leukotrienes, the leukotriene responses will be successfully blocked. Zileuton has proven to inhibit bronchoconstriction induced by various allergens, and has provided benefits in asthma.

**Clinical Application**

**Side effects**

Zafirlukast and zileuton are the only two antileukotriene drugs that have significant side effects based on clinical experience to date. Montelukast has an advantage over the other two drugs because it has not only proven to be effective but also lacks side effects seen with zafirlukast and zileuton. Zafirlukast (Accolate): Side effects that were reported by patients and volunteers are as follows: headache, infection, nausea, diarrhea, and abdominal pain. Zileuton (Zyflo): The side effects for this oral medication include headache, pain, abdominal pain, loss of strength, and dyspepsia. Perhaps the most serious side effect of Zyflo is the elevation of liver function tests. Thus, monitored liver enzyme testing is recommended. Symptoms of liver dysfunction may also develop, which include right upper quadrant pain, nausea, fatigue, lethargy, pruritus, jaundice, or flu-like symptoms.

**Drug Interactions**

Zafirlukast and zileuton are the only medications that have drug interactions. Montelukast has another advantage over zileuton and zafirlukast because it has been proven effective with no drug interaction.

Zafirlukast: In a drug interaction study in volunteers, zafirlukast was found to have drug interaction with warfarin. Zafirlukast caused prothrombin time to increase by 35% in some individuals. This interaction is most likely due to the inhibition by zafirlukast of a cytochrome isoenzyme system. Thus, Accolate may have an effect on other drugs that are known to metabolize the cytochrome isoenzyme system.

Zileuton: Zileuton has drug interactions with two drugs that are important in respiratory care, theophylline and warfarin. Zileuton causes an increase in the concentration of theophylline and prothrombin time when given with these drugs. To decrease the effects of the drug interaction with warfarin, the dosage amounts should be adjusted and monitored.

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**Table 1.** Summary of dosage, age, drug interactions, and side effects for the 5-lipoxygenase inhibitor Zileuton (Zyflo) and the leukotriene receptor antagonists Zafirlukast (Accolate) and Montelukast (Singulair).

<table>
<thead>
<tr>
<th>Drug &amp; Chemical Name</th>
<th>Age</th>
<th>Dose</th>
<th>Interactions</th>
<th>Side Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Zileuton (Zyflo)</strong></td>
<td>≥ 12</td>
<td>600 mg, qid</td>
<td>Warfarin, Seldane, Theophylline, Propranolol</td>
<td>Liver enzyme elevation</td>
</tr>
<tr>
<td><strong>CysLT₁ Receptor Antagonists</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zafirlukast (Accolate)</td>
<td>≥ 12</td>
<td>20 mg, bid</td>
<td>Warfarin, Seldane, Theophylline</td>
<td>Possible liver enzyme effects</td>
</tr>
<tr>
<td>Montelukast (Singulair)</td>
<td>≥ 6</td>
<td>5 mg (chew)</td>
<td>None</td>
<td>None</td>
</tr>
</tbody>
</table>

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“**Asthma**” continued on page 5
“Asthma” continued from page 4

Efficacy
Montelukast

In terms of efficacy, the newer generation of leukotriene antagonists is more promising. Studies show that leukotriene receptor antagonists inhibit several factors that provoke airway narrowing, such as exercise and allergens.13 Montelukast has proved to significantly improve airway obstruction.14 In a placebo-controlled study, the clinical effect of montelukast and placebo were compared. Of the 881 patients who participated in the study, 408 patients were given the montelukast treatment, 10 mg. once daily at bedtime, while 273 patients were given the placebo treatment.14 With the montelukast treatment, improved airway obstruction was shown by an increase in the forced expiratory volume in 1 second (FEV1) of 13.1%, whereas the placebo treatment showed a 4.2% increase.14 In addition, the morning peak expiratory flow rate (PEFR) was 24.0 L/min (placebo, 4.6 L/min.) while the evening PEFR was 15.9 L/min. (placebo, 4.2 L/min.).15 The airway improvement shown in the evening PEFR suggests that the 10 mg. of montelukast given once daily can provide protection throughout a 24-hour interval.16 These improvements in airway obstruction were consistent throughout the period of the study. Thus, this clinical study demonstrates that montelukast provided a clinical benefit by consistent and significant improvement of airflow obstruction, patient-reported endpoints, and asthma outcomes.17

In another study, montelukast provided significant protection against exercise-induced asthma. This 12 week, placebo-controlled study evaluated the effect of montelukast once daily on airway hyperresponsiveness to exercise and the overall clinical condition of patients with mild asthma.18 Two hundred fifty patients were screened for this study, but only 110 patients who had asthma for more than one year participated.19 The protection against bronchoconstriction by the montelukast therapy was significantly greater than that of the placebo treatment. The area under the FEV1 curve showed a 47.4% degree of inhibition by the montelukast treatment compared with placebo treatment.19 In addition, the montelukast therapy had no adverse effects throughout the period of the study. Thus, the 10 mg. of montelukast once daily provided significant protection against exercise-induced bronchoconstriction.19

Zafirlukast

By blocking receptors that mediate bronchoconstriction, vascular permeability, and mucous secretion, zafirlukast has shown to significantly improve the symptoms of asthma.20 A U.S. conducted study showed that Accolate improved asthma symptoms within one week of starting treatment.21 With the zafirlukast treatment, 20 mg. twice daily, the patients had a FEV1 of 5 liters.22 Moreover, the Accolate treatment showed a morning PEFR of 22.06 L/min. (placebo 7.63 L/min.) and an evening PEFR of 13.12 L/min. (placebo 10.14 L/min.).23 These results show that zafirlukast is an effective drug in the improvement of mild to moderate asthma symptoms. However, there is some variability in the protection afforded by zafirlukast.24 A study evaluating the challenge of exercise using 20 mg. of zafirlukast provided complete protection to three patients, while four patients had only partial protection and one patient had no protection.25 Although this study shows that the protection afforded by zafirlukast is questionable, this receptor antagonist still has high efficacy. Thus, zafirlukast has shown to significantly improve airway function and reduce asthma symptoms.26

Zileuton

Zileuton has shown to be effective in providing benefits in chronic asthma.27 In a 4 week study, Zyflo improved airway function and symptoms.28 This placebo-controlled trial used patients with mild to moderate asthma at the highest dose of 2.4 gm./day.29 The data from the study showed a mean increase in FEV1 of 13.4% and a PEFR increase of 10%. In addition, there were no significant side effects reported, and the protection afforded by zileuton was found to last up to 10 days.30 In a one-week study, zileuton improved airway obstruction, as well patient-reported end points.31

Conclusion

The recent understanding of asthma has led to the use of antileukotriene treatment, which has provided a new direction for asthma therapy. The new leukotriene inhibitor therapy includes zafirlukast, montelukast, and zileuton. The leukotrienes make up a class of inflammatory mediators synthesized from arachidonic acid, and the cysteinyl leukotrienes have been found to play an important role in asthma. Cysteinyl leukotrienes are released by inflammatory cells in human airways, which cause bronchial constriction, vascular constriction, increased microvascular permeability, and mucous secretion. The antileukotriene medications are proving to be well tolerated and effective in asthma treatment. In terms of efficacy, studies show that 5-lipoxygenase inhibitors and cystLT receptor antagonists provide a clinical benefit to asthmatic individuals. However, montelukast (Singulair) has an advantage over the other two agents because it has proven to be effective with only minor side effects and no drug interactions. Although the antileukotriene agents have provided new opportunities, existing asthma treatments are still effectively used. Perhaps, with the use of the antileukotriene therapy in combination with existing asthma medications, a new level in the treatment of asthma will provide more asthmatic individuals with greater opportunities.

“Asthma” continued on page 6
Call for Summer Forum Abstracts & Poster Presentations

The 2000 Summer Forum, scheduled for June 2-4 in Vail, CO, will offer two opportunities for participants to share their scholarly activities with colleagues:

- Research abstract presentations dealing with respiratory care education. (Paper presentations will be limited to 15 minutes, including five minutes for discussion.)

- Poster presentations dealing with education models, methods, or materials that can be shared for noncommercial use. (Individual topics and presenters will be briefly introduced; additional time will be allowed for individual review of posters or display materials and interaction with the presenters.)

Research abstracts and the Education Section Review Committee must submit poster presentation proposals by February 21 for review. All abstracts and proposals will be peer-reviewed, and authors will be notified of decisions by April 3. Questions may be directed to Gudrun Pryor, BS, RRT, AARC Introduces its all-new Online Bookstore!

Visit AARC’s link to Amazon.com at:

http://www.aarc.org/bookstore/

You’ll find the latest sources on respiratory therapy, healthcare management, and more...

15% of book sales benefit AARC, so you’ll know you’re helping support the profession when you buy!
Favorite Web Sites
by David W. Chang, EdD, RRT and Arthur Jones, EdD, RRT

For work:
http://andromeda.rutgers.edu/~jlynch/
Writing/ (Grade = A+)

Guide to Grammar and Style by Jack Lynch, assistant professor of English at Rutgers University, is an extremely useful site for improving one’s writing skills. While most word processing programs provide grammar and spell check functions, this site gives simple instructions and clear examples on many topics, including paragraphs, parameter, parentheses, participles, etc. A click on “dangling participle” gives you the following mini-lesson:

Dangling Participle. A participle is a verb ending in “ing” and is called dangling when the subject of the “ing” verb and the subject of the sentence do not agree. An example is, “Rushing to finish the paper, Bob’s printer broke.” Here the subject is Bob’s printer, but the printer isn’t doing the rushing. Better would be, “While Bob was rushing to finish the paper, his printer broke.” (Pay close attention to sentences beginning with “When ___ing.”) One way to tell whether the participle is dangling is to put the clause with the participle right after the subject of the sentence: “Bob’s printer, rushing to finish the paper, broke.” doesn’t sound right. Not all words ending in “ing” are participles: in the sentence, “Answering the questions in chapter four is your next assignment,” the word “answering” functions as a noun, not a verb. (These nouns ending in “ing” are called gerunds.)

—Arthur Jones

For fun: http://www.ebay.com (Grade = A)

If your monthly long-distance phone bills approach three digits (in front of the decimal point), you may want to consider getting one of those pre-paid phone cards that carry an extremely low per minute charge. These cards often do carry a connection charge and/or a monthly maintenance fee. But while the initial fees are high, the “talk time” charge can be as low as one cent per minute! Obviously, it is to your advantage only if the long distance calls are long (30 minutes or more). It is ideal if you and/or your children have friends and relatives far away and like to talk, talk, talk.

To get more information about prepaid phone cards, visit http://prepaid.phonecall.net/ Cards/unocon.htm and scroll down to the bottom of the page to the FAQ (Frequent Asked Questions) section. There you will find many online auction sites where you can buy prepaid phone cards that suit your needs. The most comprehensive and user-friendly is probably eBay. Go to http://www.ebay.com and search “1 cent phone card” or search “prepaid phone card” and save, save, save.

—David Chang

Submission Guidelines For Bulletin Articles

All section members are encouraged to share information about their programs through articles in the Bulletin. Here are our guidelines for submission:

Article length: Bulletin articles may be between 500 and 1,000 words.

Format: In addition to a paper copy, all articles must be submitted on a 3½ inch floppy disk saved in Microsoft Word or TEXT ONLY (ASCII) formats, or e-mailed to the editor in one of those formats.

Deadlines: All articles must be submitted to the editor according to the following schedule of deadlines:

Jan.-Feb.: December 1
Mar.-April: February 1
May-June: April 1
July-Aug.: June 1
Sept.-Oct.: August 1
Nov.-Dec.: October 1

Article Review: All authors may review a copy of their article before it goes to press. If you would like to review a copy of your article, please include a FAX number when you submit it to the editor. It is the responsibility of the author to: 1) request the opportunity to review the article before it goes to press, and 2) contact the editor by the stated deadline if any changes need to be made before the article goes to press.

Visit AARC on the Internet—
http://www.aarc.org
In the last issue of the Bulletin I requested updates for your Resource Directory and announced that an updated version would be printed and mailed with this issue. However, upon examining the current list more closely, I realized that merely “calling for updates” wasn’t sufficient to get the list into prime condition. For example, many people on the list have not given me current contact information including email addresses which for many is a key networking tool.

I have decided to spend some serious time rebuilding your Resource Directory into a tool that will be the most helpful possible. While that process is underway, I believe it is best to simply post the current list on your section’s home page on AARC Online. In doing so I can make regular updates and the information you access will be entirely accurate. Until new lists are compiled and printed, I recommend you refer to your section’s home page for current information. If you do not have access to the Internet, you should use your printed list from 1999 keeping in mind that some of the information is no longer accurate.

So now, again, I am calling for your support of the Education Resource Directory. If you are on the current list, please send me confirmation of your contact information as listed and also give me your email address. If you want to be added to the list, please send me the information requested in the form below. You may complete the following form and mail or fax it to me (11030 Ables Lane, Dallas, TX 75229 / 972/484-2720) or the best option would be to email me (hagen@aarc.org). With your help we will soon have a truly helpful Resource Directory filled with names of people who are dedicated to helping others in their field succeed — and you will have accurate contact information to make it as easy as possible to take advantage of their expertise and advise.

| Name | __________________________________________________________________________________________________________ |
| Address | ________________________________________________________________________________________________________ |
| Phone | __________________________________________________________________________________________________________ |
| e-mail | __________________________________________________________________________________________________________ |

Areas of Expertise: (Check all that apply)

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